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THE BOTANICAL REVIEW

Interpreting Botanical Progress

PLANT LIFE AND THE LAW OF MAN

IV. BARBERRY, CURRANT AND GOOSEBERRY, AND CEDAR CONTROL

A History of Legislation and Litigation in the United States
Respecting Eradication and Quarantine of Alternate Hosts
in the Control of Three Heteroecious-Fungus Diseases—
Black Stem-Rust of Wheat, White Pine Blister-Rust and
Apple Rust

EDMUND H. FULLING 483

PROPOSED FUTURE
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The Botanical Review

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I. BARBERRY²

INTRODUCTION

In 1865 Anton de Bary (47)³, the great German botanist of the University of Strasburg, put the finishing touches to a series of investigations by himself and others (125) which established one of the most significant truths in the biology of plants, namely, that the common barberry of Europe, *Berberis vulgaris*, plays a very important rôle in the life-cycle and dissemination of wheat rust. In many parts of the Old World where wheat, rye, oats and barley had long been cultivated, a disease since known as black stem-rust or wheat rust had wrought havoc for centuries, especially in wheat fields, and proper understanding of the cause was not acquired until these investigators revealed the true nature of the scourge. In short, their revelations showed that the rust on cereal grains and a disease prevalent on barberry leaves were caused by the same agency, a fungus, known since 1797 as *Puccinia graminis*, which spread from wheat and the other cereals to barberry and from barberry to the cereals, and that the presence of barberry was necessary for dissemination of the disease in grain fields.

² Parts of this chapter were published in a shorter account of the same subject in the June, 1942, issue of the Journal of the New York Botanical Garden, permission by which has been granted for reprinting here.

³ Barberry citations are on pages 574-581 of the bibliographies.

With slight modification, this explanation has withstood repeated investigation since it was first announced. It has since been learned that, in addition to the four kinds of cereal mentioned, fifty or more cultivated and wild grasses also serve as alternate hosts of the fungus which is world-wide in distribution. It has been found, too, that the fungus can, to some extent, over-winter on winter wheat in mild climates of the southern United States, South Africa and Australia, and thus reappear year after year on grain without intervention of barberry as an alternate host and in areas where bushes are unknown. In northern regions, however, barberry is necessary for perpetuation of the disease from one season to another, except where wind currents carry the spores from southern to northern regions as the season advances.

Before this important factor of southern spores being blown northward was appreciated, the dependence of the fungus upon barberry for completion of its life-cycle carried the general implication that if susceptible barberry bushes were not at hand, the disease could not ravage cereal crops in northern latitudes. It is natural, then, that as proper understanding of the rôle of barberry became more widespread and established among wheat farmers, an effort was made to eradicate the bushes from wheat-growing areas. The task, obviously, was prodigious, and the endeavor to eliminate the bushes was destined to be a failure unless concerted action over large areas were secured. Voluntary cooperation among farmers, most of whom did not understand the nature of the disease, and especially on the part of others less concerned in the matter, fell far short of attaining effective results. The need for action eventually became so urgent, however, that legislation finally was adapted to meet the situation.

LEGISLATION

European

While this article deals primarily with American affairs, European legislation on barberry eradication constitutes so important a background to American legislation in the same direction, that it can not very well be omitted from consideration.

Particular interest attaches to the very first legislative effort toward barberry eradication, for, if our sources of information are correct, it was instituted more than 200 years before the cause of

wheat rust was fully understood. For centuries the farmers of Europe had recognized a correlation of some sort between the blasting of wheat, as the condition induced by the fungus was called, and the presence of barberry. It was inexplicable to them, but the instances were so many and the proximity of barberry and blasted wheat so convincing that many in Europe destroyed the bushes which grew in the neighborhood of their grain fields. Finally, about 1660 the French farmers around Rouen secured passage of a law requiring destruction of barberry bushes in wheat areas. There is not any known public record of this ordinance, and our knowledge of it, though probably accurate, is secondhand. A German author, publishing in 1904 (85), referred to the writing of a Frenchman in 1830 (92) in which the latter mentioned this edict of Rouen. Two other French writers (90, 106), of the late nineteenth century, also made reference to this ordinance, presumably on the strength of the 1830 report. The German author said that in spite of investigations he was unable to find any more direct information on the subject. He reported that the Mayor of Rouen referred him to the "archiviste paléographe de la Préfecture de la Seine inférieure en Rouen" who examined the registers of 1660 and 1760 but was unable to find any mention there of the edict. Some doubt is cast, therefore, upon the authenticity of the edict of Rouen, but the report has been widely accepted by writers on barberry eradication and is always an interesting point at which to begin discussions of eradication legislation.

Similar decrees may have been issued elsewhere in Europe during the 17th century, but the next records are those of 145 years later in 1805 when the province of Schaumburg-Lippe in Germany required by law that all barberry bushes be removed by December of that year (108). In 1815 the Bremen Senate ordered that all bushes within 500 feet of grain fields be eradicated (85, 108). Prussia, in 1880, took action, and in 1920 Bavaria did likewise (108). By 1923 there were 25 laws and police orders in various political subdivisions of Germany directed toward elimination of the guilty plants (108).

France, meanwhile, had awakened to further need since the law of Rouen, and in 1888 the government permitted local administrative districts to proscribe barberry within their limits (108). In 1891 the Department of Eure-et-Loire made its own law (108).

Denmark, after a bitter quarrel which lasted more than 50 years, passed a law in 1869 which gave everyone the right to demand extermination of barberry bushes. This law was not very effective, but one which superseded it on January 1, 1904 (1, 67, 68, 108), met the situation so well by requiring complete destruction of barberries, except in botanical gardens and a few other restricted areas, that Denmark has since served as the outstanding example of successful control of wheat rust by barberry eradication.

In 1882 a law was passed in Steiermark, Austria (108); in 1916, in Norway (69, 108); and in 1920 by the Ministry of Agriculture in Hungary (108). In England very successful eradication campaigns have been voluntarily conducted, much to the credit of English farmers and others about them who thus secured the desired results by voluntary cooperation without recourse to law.

Finally, in this very brief consideration of legislative efforts toward barberry eradication outside the United States, mention must be made of Canadian measures, beginning in 1917, which eventually included the Provinces of Manitoba, Saskatchewan and Ontario.

In general, all efforts in Europe, in Denmark, Holland, Germany, Norway, England and France, voluntary and otherwise, have been rewarded, for the most part, by marked success, and have served as a basis upon which eradication work in America was undertaken in 1918. Before considering that extensive enterprise, however, we must first give heed to similar efforts in Colonial times.

Colonial American

When the English colonists came to America in the seventeenth century they brought with them the barberry of Europe as their favorite hedge plant, as well as seed for their crops of wheat and other cereals. The barberry soon became naturalized in New England, spreading from one region to another. Along with it was imported the rust fungus, and it was inevitable that sooner or later the combined presence of wheat, barberry and the rust should cause trouble.

It was not many years, indeed, before the wheat fields of New England were blasted. The disease first appeared about 1660 (49) and thereafter the supplies of flour were seriously threatened. As in Europe, many observations were made concerning the proximity

of barberry bushes, either deliberately planted or naturalized, to infected wheat fields. It is unlikely that the New England farmers had ever heard of the ordinance of Rouen in 1660, but their own observations convinced at least a few of them that barberry had something to do with their poor crops. Many, therefore, proceeded to rid their lands of the bushes, but their efforts were in vain when neighbors failed to cooperate. Eventually the situation became so bad and the farmers so desperate that something had to be done to appease their wrath and offer a possibility of relief. Contrary to supposedly more learned opinion on the matter at the time, even among botanists of the day, they insisted that barberries had something to do with the terrible state of affairs, and upon the strength of this conviction they finally succeeded in securing remedial legislation in three of the colonies.

Connecticut. Connecticut must be given credit for having been the first to act. In 1726 the General Court passed a law (139), the preamble to which, however, betrayed some doubts on the part of those who formulated it, for it said:

Whereas the abounding of barberry bushes is thought to be very hurtful, it being by plentiful experience found that, where they are in large quantities, they do occasion, or at least increase, the blast on all sorts of English grain. . . .

Despite the skepticism very delicately injected into this paragraph, the law proceeded to give power to the town meetings in the colony to adopt measures toward eradicating the bushes, and imposed a penalty of 20 shillings, to be paid into the town treasury, on anyone refusing to abide by whatever measures might be taken. Continued refusal to cooperate incurred a further fine of ten shillings per month until cooperation was secured. The entire matter of barberry control was thus referred to the several towns with no concerted action in the colony as a whole. Moreover, there was a provision to the effect that anyone using barberry bushes as fencing could not be fined until after just satisfaction was made to him by the town for destruction of his bushes. The ordinance, as a whole, was probably very ineffective, for, as one commentator has observed (56):

the hands of the opponents of the bill are to be seen in the proviso, which threw upon the towns the necessity of first settling with farmers who might claim that the offending bushes were made use of or depended upon as fences, before they could enforce any penalties of the Act.

In spite of its inadequacy to meet the needs and its probable unenforcement, this statute was supposedly in effect 53 years. At

the end of that period, in 1779, Connecticut amended its statute (140) by granting authority to anyone with the consent of the civil authorities to eradicate barberry bushes in March, April, October or November from any land where they might be growing; and anyone so doing was not liable to action for damages, trespass or other cause. That was after Massachusetts and Rhode Island had adopted their laws for the same purpose. In 1821 (142), by further change, removal of barberry bushes was sanctioned in Connecticut for any season in the year, not merely in the previously specified four months. Furthermore, by this same amendment, eradictory action might be taken by vote in town meetings and at the expense of the towns concerned, as well as upon the entreaties of individuals. In this revised form and with a few additional minor alterations in wording, the law reappeared on the statutes in 1824 (142), 1835 (142) and 1838 (143), but was repealed in 1848 (144).

There does not appear to be any record of how many towns or citizens in the colony took advantage of the privileges granted in either the original law or its amended forms. Timothy Dwight, however, who was President of Yale College, did record (58) that:

In the year 1796, the town of New Haven granted 200 dollars, for the purpose of destroying the barberry bushes, within its limits. Individuals are supposed to have expended at least as much more. They were principally destroyed, especially upon Mount Pleasant. The method adopted to destroy them was to eradicate them. The following year there was no blast; and from that time to the present both the wheat, and the rye, have been generally free from this evil.

Massachusetts. Twenty-five years elapsed after Connecticut's original move before further legislative action was taken in New England, this time by the General Court of Massachusetts (153, 153a). This court, the governing body in Massachusetts at the time, passed a law in 1754 which arbitrarily ordered that all barberry bushes in the colony be destroyed by June 10, 1760. It was definitely only a temporary act, for it contained the provision that it was to expire after nine and one half years, on June 10, 1764. The law was the most lengthy of early American statutes on barberry eradication and made provision for a number of contingencies. For instance, anyone might enter upon any property, if barberries growing thereon had not been destroyed by the specified date, and destroy the bushes, presenting a fair account of his labor and charges involved to the owner or occupant of the land. Three months

notice of such intended action had to be given to the owner or occupant, however. If the owner or occupant refused within two months to make reasonable payment, the other party could bring an action before any justice of the peace, if the charges were less than 40 shillings, or before the county court, if more, and might then recover double the value of his expenses and labor. Towns and districts, too, were subject to a fine of two shillings per barberry bush standing along their private and public highways after June 10, 1760. It was up to the surveyors to see that the bushes were eradicated. One half of such fines was to be paid into the county treasury, the other half to the informer. Finally, owners of land had to reimburse their tenants for expenses and labor in removing bushes, and if they neglected to do so, the tenants might withhold sufficient rent to compensate themselves.

All knowledge of this legislation and of the experiences which led up to it, according to one student (56), would seem to have been forgotten for about 30 years after its expiration on June 10, 1764. Commenting further on the law, he says:

It will be seen that five years and a half were given within which owners of the land were to extirpate all the barberry bushes in the Province, and that provision was made for procuring the work to be done in the case of common or undivided lands, as well as in cases of doubtful responsibility such as that of bushes growing in division walls. To secure the accomplishment of this work, reliance was placed upon the authority given to the general public to perform it in case of neglect by the owner. The Act was of a temporary nature. It expired by limitation in 1764. Much of the legislation of that day was temporary, and if there seemed to be occasion for renewal, the operation of such statutes was from time to time extended. This particular statute was not extended. Whether we may infer from this its success or its failure, is a matter purely for conjecture. In view, however, of the fact that modern botanists have established beyond doubt a connection between the barberry bush and the rust which infests wheat, it would seem probable that this wholesale attack upon the barberry bushes of Massachusetts probably had such a beneficial effect that when the time of expiration of the Act came round, it was not thought necessary to stimulate farmers by public legislation to protect their wheat fields in the future.

The author of these lines, by his own admission, was discoursing upon a topic outside his usual field of intellectual endeavors, and he presented his comments to an historical, not a scientific, assembly. In view of this and of nineteenth century difficulties, as we shall later note, his optimism with respect to the efficacy of the Massachusetts law is both understandable and to be questioned.

Rhode Island. The third and last of the New England colonies to outlaw barberries was Rhode Island. In 1766 the legislature at-

tempted to compel eradication in one section of the colony by passing a special law for the Town of Middletown (173, 174), which "was so cumbersome in its machinery as to be doomed to failure" (49). It enabled anyone, through a justice of the peace, to have barberry bushes removed from anyone else's land. The complainant, however, had to assume the expense for such action.

As one commentator has said (56):

If the title of this Act had been changed to "An Act to protect barberry-bushes in Middletown", it would have defined its apparent purpose about as well. The method of procedure laid down for the free-holder of the town who wished to compel his neighbor to eradicate the barberry bushes in his fields was so complicated, elaborate and expensive, and so many dangers lurked under the phrase, "doing as little damage to the owner of the land as the case will admit of", that it practically insured the peaceful life of barberry bushes in Middletown.

The inadequacy of this law must soon have become apparent, for six years after its passage, in 1772, a committee of two was appointed to prepare a bill for destroying barberry bushes throughout the Colony. A little later the same month such a bill was passed (176). It again enabled anyone to compel anyone else to remove barberry bushes from the latter's land. The informer, in this statute, too, was to receive one half of the £10 fine imposed for refusal to accede to requests to trim or destroy barberries. The towns of the Colony also were required to remove the bushes from along their highways.

This law was enacted, of course, before the American Revolution. After that struggle it was included in the 1798 revision of public laws (177). By way of revision the word "State" was substituted for "Colony" and the fine became \$30 in lieu of £10. Otherwise the law was unchanged. In the next revision, that of 1822, it does not appear.⁴

Summary. Thus ended the early American attempts to control wheat rust by banishing barberries. By way of recapitulation we can do no better than borrow again from our already thrice quoted author (56):

A glance at the chronology of this legislation is instructive as well as interesting. The Colony of Connecticut began the war against barberry bush in 1726. The subject was taken up in the Province of Massachusetts Bay in 1756 [*sic*]. Ten years later, Rhode Island was awakened to the situation and joined, in a half-hearted way, in the fight. After an interval

⁴ Examination of what the author has good reason to believe were all the colonial laws of Rhode Island up to 1823 did not reveal either the dates or the acts of either the amendment or the repeal.

of six years this last Colony, in 1772, took the subject up again and this time passed an act which, if not all that the enemies of the barberry bush might wish, was at any rate much more pronounced in its efforts to secure the destruction of the bush than the earlier statute. Then comes the second attack of Connecticut, now a State, in 1779. This statute was perhaps capable of being made more effective than the law of 1726, but was still hampered by the deference to the town officers which was the characteristic feature of the first legislation on the subject, and which is perhaps to be explained by the system of representation which has prevailed there from the days of the Charter to the present time.

These early laws did not sink completely into oblivion but attracted attention in later years (21), even in Europe (85, 96, 104, 107), and some success was recorded as having attended them. It seems safe to assume, however, that since there was no unified action in the colonies with respect to the laws, the depredations of rust could not have been markedly curtailed. The laws are interesting primarily from an historical viewpoint and because they antedated by so many years a correct understanding of wheat rust, let alone the many more years before that understanding was sufficiently well established that really effective results could be achieved. For that development in America we must pass over 150 years into the first quarter of the twentieth century.

Twentieth Century American

There does not appear to have been any legislative action regarding barberry eradication in the United States between the colonial days of New England and the first quarter of the twentieth century. During the intervening years barberry was gradually spreading westward through New England, New York and the Ohio Valley as a naturalized plant and through the agency of settlers who valued the plants for ornament and hedges, the berries for jelly and the yellow roots for dyestuff. Eventually it became well established in the great wheat-growing areas of the upper Mississippi Valley where its pernicious rôle in destruction of crops very gradually attracted growing attention as millions of dollars worth of grain was being lost to the rust. During part of this period, the European investigations, already mentioned, were in progress, and when it became definitely known that barberry was an indispensable host in the life-cycle of the rust, the idea of barberry eradication as a control measure was no longer merely hypothetical. It had a scientific basis. That basis has since been strengthened by incontrovertible evidence that barberry functions not only as the

alternate host of the parasite but also as a place of origin of new physiologic strains of the rust which may be more virulent than previously existing forms and which may thus endanger hitherto resistant varieties of wheat.

But just as so many other necessary reform measures have been brought about only by extreme urgency, so did barberry eradication require particularly bad conditions before the idea could be consummated. Those conditions were a series of rust epidemics, culminating in 1916, and the demands for food conservation engendered by World War I during the following years. Cereal diseases, including black stem-rust, in 1916 destroyed more than 180,000,000 bushels of spring wheat alone in North Dakota, South Dakota, Montana and Minnesota, enough to have made 11,000,000,000 1-pound loaves of bread. Continuation of such waste, with the likelihood of even greater losses, seemed calamitous. Something had to be done, despite the fact that wheat and the other afflicted grains had been extensively cultivated for centuries in Europe and Asia and had sustained millions in the population of those continents in the face of uncontrolled depredation by the disease. But the modern age demanded remedies, and in 1917 we find the beginning of a widespread campaign to eradicate the bushes from the wheat-growing regions of the north central States in the upper Mississippi Valley. The legislative measures involved, by additions from time to time, have accumulated into a considerable body of regulations which may conveniently be divided into four categories, *viz.*, State Laws; Federal Quarantine, State Quarantines and Departmental Orders.⁵

*State Laws.*⁶ Connecticut and probably Rhode Island, as we have already noted, carried their colonial regulations into the nine-

⁵ This classification is very artificial and subject to much criticism, for the difference between the groups, especially the latter two, is not always clear. It is convenient, however, for present purposes of historical consideration. "Laws", State and Federal, are enacted by legislative bodies meeting in session, whereas "quarantines" are issued by individuals, departments, commissions, *etc.*, authorized to do so by "law". Our category of "departmental orders", on this basis, is indistinguishable from "quarantines", except that such orders are not officially referred to as "quarantines".

⁶ Accounts of particular legislative acts and regulations are necessarily much abbreviated in this article. Space permits mention of only a few features in each instance. For complete understanding of any one law, *etc.*, original accounts must be consulted. The author has attempted to furnish references for as many as possible. In addition to laws, *etc.*, specifically directed against barberry, *Ribes* and red cedar, and discussed in this study, most States have other and more general laws regulating dealings with plants

teenth century as State laws before abrogating them. Years later, in 1917, South Dakota took the lead in the revived crusade by adding barberry to the list of "noxious weeds" which owners and occupants are required to remove from their lands (178*a, b, c*). Three days later, through the efforts of Dean H. L. Bolley, botanist at the North Dakota State College (137), the legislature of that State entered on its books a statute (168, 169) which declared all barberries, except the Japanese, "a public nuisance and a menace to the public welfare", and required that all such plants in the State be destroyed after approval of the law. If anyone neglected to destroy barberries under his control within ten days after being notified to do so by the proper authorities, the latter were authorized to remove the plants and to place a tax lien against the property for the expenses incurred. Five thousand dollars was appropriated for enforcement of the law, and disregard of notices to eradicate bushes carried a fine of \$25 in addition to the charges incurred for removal of the bushes by the civil authorities.

Two years later, in 1919, seven other States enacted similar laws, Iowa (145-151), Montana (98, 99, 163-165), South Dakota (178, 179), Minnesota (161, 162), Nebraska (166, 167), Michigan (154-159) and Wisconsin (181), named here in the sequence of their laws becoming effective. Iowa banned "any species of *Berberis* or *Mahonia* susceptible to infection by *Puccinia graminis* . . . but not including Japanese barberry" and any other alternate host of a dangerous plant disease. In this instance, too, charges for removing bushes after failure on the part of owners to do so within ten days after receiving notice, became a tax lien. The laws of the other States are very similar to the foregoing in their general provisions for application, enforcement and penalties, four of them applying to any form of *Berberis* or *Mahonia* susceptible to infection, while that of Michigan applies specifically to *B. Aquifolium*, *B. vulgaris*, *B. canadensis*, *B. ilicifolia* and *B. sinensis* as well as to their hybrids and varieties, and to any mahonia bush. *B. Thun-* and also bearing upon barberry, *Ribes* and red cedar. These regulations are not considered because this article purports to present only an historical account of legislative development specifically designed to control the three economically important fungus diseases which it considers. The article is not intended as a legal guide in the nursery or any other trade; nor is it to be regarded as a history of eradication work.

The only other compilations of eradictory measures, known to the present author, are citations Nos. 50 and 63 of the barberry bibliography, and Nos. 72, 110, 111 and 121 of the currant and gooseberry bibliography.

bergii is exempted in every case. In 1927 Michigan revised its law (160) by exempting *Mahonia repens*, which had been found not to be susceptible to infection by the rust, and the varieties *atropurpurea*, *minor* and *Maximowiczii* of *B. Thunbergii*.

In 1921 Wyoming (183, 184) outlawed all barberry bushes, except the Japanese, and established a fine of \$10 to \$25 for each offense of refusal to remove bushes. Lastly, so far as State Laws are concerned, Oregon made it unlawful in 1923 to grow, propagate or distribute *Berberis vulgaris*, subject to a fine of \$100 (44a, 170, 171); Washington ordered everyone owning or having charge of premises supporting rust-susceptible barberries, to destroy such bushes (179a, 179b); and Minnesota supplemented its special anti-barberry law by adopting another which required owners or occupants of land to destroy all "noxious weeds", which term, as defined, included common barberry (161a, 162a).

In short, eleven States, South Dakota, North Dakota, Iowa, Montana, Minnesota, Nebraska, Michigan, Wisconsin, Wyoming, Oregon and Washington followed one another in adopting State laws against barberries in the 1917-1923 period. On Oct. 1, 1943, these laws were all still in force, in either their original or amended forms. To a greater or less extent than the others, each of them makes provision for enforcement, designates enforcing agencies and stipulates penalties.

Federal Quarantine. Though South Dakota was the leader and other States followed suit, the really unifying factor in the entire barberry eradication effort was established in 1918 through the cooperative work inaugurated that year by the United States Department of Agriculture and various agencies in 13 States in the wheat-growing areas. These States were Colorado, Illinois, Indiana, Iowa, Michigan, Minnesota, Montana, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin and Wyoming. They constituted what became known as the eradication area which covered practically the entire spring-wheat area of the United States. That year Congress appropriated \$150,000 toward the work of eradicating barberries from this vast region. The work was carried out by the Office of Cereal Investigations of the Bureau of Plant Industry in cooperation with agricultural colleges, departments of agriculture and other public and private agencies in the 13 States; in 1934 the work was assigned to the Bureau of Ento-

mology and Plant Quarantine. The work itself, a prodigious undertaking, is beyond our immediate interest. Its organization, methods of operation, personnel, financing, publicity and other campaign aspects have been topics of considerable writing in governmental and other publications.

As part of this campaign, the Federal Horticultural Board sent letters and pledge cards to 6,104 nurserymen throughout the United States in an effort to secure their voluntary cooperation in not shipping common barberry and hybrids or varieties thereof into or within the States constituting the eradication area (93). Two thousand nurserymen are reported to have signed the pledge (37), but sufficient voluntary cooperation for really effective results could not be achieved. In 1919, accordingly, Federal Plant Quarantine No. 38 was established, effective on and after May 1 of that year (8, 30, 35, 37-39, 71). This, the wheat rust, black stem-rust or barberry quarantine, as it is variously known, prohibited shipment of 31 rust-susceptible species of *Berberis* and four of *Mahonia*⁷ from any State outside the eradication area into any within it but did not prohibit interstate movement of the plants within or outside the area. Japanese barberry and any plants to be used by the United States Department of Agriculture for experimental purposes were exempted. Since April, 1918, these restrictions had been in force to some extent by mutual agreement among the nurserymen who had signed the pledge. In 1922 Congress appropriated \$500,000 to carry on the work, and by that time every State in the area had a law, quarantine or other ruling of its own to supplement the Federal quarantine.

Three amendments were later made to this quarantine. In 1923 *Mahonia repens* was exempted from its provisions (13, 129). This change was made because it had been found that the rust on that species is not caused by *Puccinis graminis* but by another fungus not destructive to grains. In 1931, as a result of two successive resolutions passed by the Central Plant Board requesting a second

⁷ *Berberis aethensis*, *B. altaica*, *B. amurensis*, *B. aristata*, *B. asiatica*, *B. atropurpurea*, *B. brachybotrys*, *B. brevipaniculata*, *B. buxifolia*, *B. canadensis*, *B. caroliniana* (*carolina*), *B. coriaria*, *B. cretica*, *B. declinata*, *B. Fendleri*, *B. Fischeri*, *B. Fremontii*, *B. heteropoda*, *B. ilicifolia*, *B. integerrima*, *B. laxiflora*, *B. lycium*, *B. macrophylla*, *B. neapalensis*, *B. Neubertii*, *B. sibirica*, *B. Sieboldii*, *B. sinensis*, *B. trifoliolata*, *B. umbellata* and *B. vulgaris* as well as its subspecies and horticultural varieties; *Mahonia Aquifolium*, *M. diversifolia*, *M. glauca* and *M. repens*.

revision, this quarantine was extended to cover interstate movement within the protected area as well as from States outside the area to those within it (14, 23, 57, 78-80, 124). The Central Plant Board consists of quarantine officers of the 13 barberry eradication States. And by the amendment of 1937 the protected area was extended to include the States of Missouri, Pennsylvania, Virginia and West Virginia (15, 20, 118, 120, 133, 134). These States, previous to their inclusion under the Federal quarantine, were actively engaged in eradication work of their own in co-operation with the United State Department of Agriculture, and asked to be included under the quarantine.

Seventeen States are thus protected today by Federal decree against introduction of susceptible forms of barberry and mahonia, and all regulations formulated in connection with the quarantine apply to these States.

These regulations, after several revisions (59, 80, 127, 128, 135) since they were first issued, provide, among other things:

that no plants, cuttings, stocks, scions, buds, fruits, seeds, or other plant parts capable of propagation of the genera *Berberis*, *Mahonia*, or *Mahoberberis*, shall be moved or allowed to be moved interstate from any State of the continental United States or from the District of Columbia into any of the protected States, . . . nor from any one of said protected States into any other protected State, unless a permit shall have been issued therefor by the United States Department of Agriculture, except that no restrictions are placed by the regulations . . . on the interstate movement either of Japanese barberry (*Berberis Thunbergii*) or any of its rust-resistant varieties, or of cuttings (without roots) of *Mahonia* shipped for decorative purposes and not for propagation (40).

Issuance of permits is based upon the known susceptibilities of the many kinds of barberry and mahonia. For this purpose four groups were first recognized in 1931, those definitely immune to the disease and not requiring any permits for interstate movement, those sufficiently resistant to the disease as to be allowed movement but under permit, those definitely subject to the disease and for which permits would not be issued, and those of undetermined susceptibility temporarily placed in the third class until their classification could be determined more accurately. More about these groups later.

State Quarantines. In 1918, the year before Montana adopted its State law, concern over possible spread of the rust into its wheat fields developed to such a degree that the Governor of that State issued a quarantine against the sale of barberry bushes and importa-

tion of them into the State (98, 99). This quarantine was superseded in 1919 by the State law, already mentioned. In 1926, however, this law was supplemented by another quarantine as a matter of convenience in handling the situation which could be done more easily under a quarantine than under the law. This second quarantine was practically identical with the first (137).

The State Entomologist of Colorado in 1918 next issued a quarantine forbidding movement of *Berberis vulgaris* into or within the State (65), and a little later that year he ordered the destruction of those already in the State (65). These two provisions were combined in a new quarantine the following year. Later, the ban against movement was extended to all species of *Berberis*, but not until 1942 was exception made, in accordance with the Federal quarantine, for 31 non-susceptible species and varieties (138).

Later, in 1918, Tennessee also placed a quarantine against all barberries, except the Japanese. Destruction of all those already in the State was ordered and no more could be brought in (138). It was not until 1941, 23 years later, that all the other immune species were given the same freedom from the law as were *B. Thunbergii* and its varieties (48). Along with this change, mention of prohibition against importation was dropped; obviously, if plants within the State are to be exterminated, it would not seem necessary to place a ban specifically against importation. Some State laws and quarantines, however, prohibit importation in addition to ordering destruction of the plants.

Also in 1918 Wyoming adopted a barberry quarantine (41).⁸ By its revised form of 1937 movement within or into the State of all but 31 kinds of *Berberis* is prohibited, and those already in the State when the quarantine was issued were ordered destroyed (33). The 31 exempted forms are the same as those specified in connection with the Federal quarantine on page 507.

Ohio, in 1919, adopted a quarantine which has undergone three revisions.⁹ By its latest revised form, that of 1939, movement within the State of all susceptible forms, as defined by the Federal quarantine, is prohibited (34).

North Dakota, in 1928, eleven years after having joined the

⁸ A copy of this quarantine was not available, either in barberry eradication literature or from State officials.

⁹ Copy of original quarantine or of its first two revisions was not available either in barberry eradication literature or from State Officials.

barberry eradication movement by adopting a State law, extended the provisions of that law to all susceptible forms of barberry and mahonia (138).

Lastly, after Missouri, Pennsylvania, West Virginia and Virginia were included in 1937 under the Federal quarantine, two of those States, Virginia (138) and Pennsylvania (138) contributed their own quarantines. Virginia prohibited planting and movement of susceptible forms, in the sense of the Federal quarantine, anywhere in the State, and gave the authorities the power to destroy these same forms in 13 counties of the State. While maintenance of susceptible forms, growing at the time the quarantine became effective, was thus permitted in the State outside the 13 specified counties, such exception was not made in the Pennsylvania quarantine of 1940. Here growing and movement of all susceptible forms, in the sense of the Federal quarantine, are prohibited throughout the State. The same 31 species and varieties are exempted in both States as in the Federal quarantine on page 507.

On June 1, 1942, the foregoing restrictions, in either their original or modified forms, were still in effect as interstate quarantines in North Dakota, Tennessee, Montana and Wyoming, and as intra-state quarantines in Pennsylvania, Virginia, Ohio and Colorado.^{9a}

Departmental Orders. Under this heading we find that in 1918 the Minnesota Commission of Public Safety declared the common barberry a public nuisance—the customary introductory observation in much eradication literature—saying that “it shall be the duty of every person owning or having charge of any premises on which barberry bushes of the rust producing varieties are growing, or at any time found growing, to forthwith destroy such bushes” (61a, 101). The same year the Nebraska State Council of Defense ordered that all common barberry bushes in the State be removed (41). The next year the Director of Agriculture in Illinois gave public notice that all forms of *Berberis vulgaris* be destroyed (138), and the Conservation Commission of Indiana issued a similar order to be carried out by the end of the year, subject to a \$10 to \$300 fine plus possible imprisonment for one to six months (138). In 1934 the State Entomologist of Missouri issued a regulation placing wheat

^{9a} According to a chart prepared by the American Association of Nurserymen in cooperation with State regulatory officials, which, according to a letter from Dr. R. P. White, Executive Secretary of the association, merited no change as late as September 7, 1943.

rust and all susceptible forms of barberry under the Insect Pest and Plant Disease Law of the State. Movement or growing of the bushes was thus prohibited (28). This was about three years before Missouri was included in the protected area recognized by the Federal quarantine. It was not until more than two years after simultaneous inclusion that West Virginia acquired a similar regulation by which black stem-rust of wheat was officially declared to be dangerously injurious (138). The authorities were thus sustained in any efforts to combat the disease in that State.

Summary

Altogether, so far as the United States is concerned, legal action against barberries was taken by three New England colonies in the eighteenth century, one and probably two of them carried over into the early nineteenth century, and in the twentieth century, so far, the Federal government and 20 States have adopted measures of some sort. Behind each of the latter, it must be realized, there was a "build up", especially since inauguration of the eradication campaign in 1918. Newspaper publicity, civic meetings, lobbyist activities and other workings of pressure groups, as well as scientific gatherings, all had their part, and rightly so, for legislation, after all, is but a response to agitation for corrective measures. In some instances, it is true, ordinances have been promulgated merely by decree as items in the discharge of responsibilities by some individual—governor or commissioner—or board, but the authority under which these bodies have performed, lay in laws enacted in response to demands. This is true not only of barberry legislation but also of that associated with white-pine blister rust and apple rust, considered later in this paper. Interesting though these aspects may be as parts of the historical development of eradication legislation, we must omit them from further detail in present considerations and confine our study to the legislative enactments in which they resulted. The relationship of all these efforts to one another, so far as barberry is concerned, can best be understood when considered from a chronological viewpoint, and for that purpose the following summary is presented.

CHRONOLOGICAL SUMMARY OF COLONIAL, FEDERAL, STATE AND DEPARTMENTAL LEGISLATION AND REGULATIONS RESPECTING ERADICATION AND QUARANTINE OF BARBERRY¹⁰

Date of Becoming Effective	Promulgating Body	Status	Principal Provisions ¹¹
1726 May	Connecticut General Court	Colonial Law Amended in 1779 and 1821; repealed in 1848.	Annual town meetings authorized to adopt measures to destroy barberry bushes (139).
1755 Jan. 13	Massachusetts General Court	Colonial Law Expired June 10, 1764	All barberry bushes ordered destroyed by June 10, 1760 (153, 153a).
1764 June 10	Massachusetts General Court	Colonial Law	Colonial law of 1755 expired (153, 153a).
1766 Oct.	Rhode Island General Assembly	Colonial Law Superseded in 1772	Anyone authorized to have barberry bushes on anyone else's land in Middletown destroyed (173-175).
1772	Rhode Island General Assembly	Colonial Law Law of 1766 superseded; amended by 1798; repealed by 1822.	Law made applicable to entire colony (176).

¹⁰ The following appropriate comment on this summary was received from the U. S. Bureau of Entomology and Plant Quarantine:

"This chronological statement does not include reference to the various Acts that make appropriations to the U. S. Department of Agriculture, which provide not only funds but also legislative authority for work directed toward the eradication of barberry. These Acts are, in effect, legislation effective for one fiscal year with respect to eradication of barberry. The legislation is not always worded the same, but it all has, in general, the same effect. In later years, however, it has differed in some respects, particularly by the addition of language requiring cooperation. These annual Acts provide the legislative authority for the Department to carry out and participate in the work of barberry eradication. The following two examples illustrate how this legislative authority is worded in the annual appropriation Acts. The Act providing appropriations for the fiscal year 1920 includes the following in the section providing funds to the Bureau of Plant Industry for work on cereals:

Provided also, That \$150,000 shall be set aside for the location of and destruction of the barberry bushes and other vegetation from which such rust spores originate."

The Act providing appropriations for the fiscal year 1943 includes the following item under Salaries and Expenses for the Bureau of Entomology and Plant Quarantine:

"Barberry eradication: For the eradication of the common barberry and for applying such other methods of eradication, control, and prevention of spread of cereal rusts as in the judgment of the Secretary of Agriculture may be necessary to accomplish such purposes, \$185,970: *Provided*, That, in the discretion of the Secretary of Agriculture, no expenditures from this appropriation shall be made for these purposes until a sum or sums at least equal to such expenditures shall have been appropriated, subscribed, or contributed by States, counties, or local authorities, or by individuals or organizations for the accomplishment of such purposes: *Provided further*, That no part of the money herein appropriated shall be used to pay the cost or value of property injured or destroyed."

¹¹ See footnote No. 6 on page 493.

Date of Becoming Effective	Promulgating Body	Status	Principal Provisions ¹¹
1779 Jan.	Connecticut General Court	Colonial Law Law of 1726 amended; fur- ther amended in 1821; re- pealed in 1848.	Anyone authorized to re- move barberry bushes from anyone else's property in March, April, October or November (140).
1798 Jan.	Rhode Island General Assembly	Colonial Law Law of 1772 amended; re- pealed by 1822.	"State" substituted for "Colony" and "thirty dol- lars" for "ten pounds" fine (177). ¹²
1821 May	Connecticut General Assembly	State Law Law of 1726, amended in 1779, further amended; re- pealed in 1848.	Legal removal of shrubs no longer limited to four months, permissible in any season; re- moval action upon vote in town meetings as well as upon requests by individuals (142).
1822	Rhode Island	State Law	Colonial law of 1772, amended by 1798, does not appear in revised laws of 1822 ¹² .
1848 June 12	Connecticut General Assembly	State Law	Colonial law of 1726, amended in 1779 and 1821, re- pealed (144).
1917 March 12	South Dakota State Legislature	State Law	Barberry added to list of "noxious weeds" which own- ers or occupants of land are required to destroy (178a, b, c).
1917 March 15	North Dakota Legislative Assembly	State Law	Destruction of all barberry bushes, except <i>B. Thunbergii</i> , ordered (168, 169).
1918 March 26	Minnesota Commission of Public Safety	Order No. 28	Destruction of common barberry bushes ordered (61a, 101).
1918 April 28	Montana Governor	State Quarantine No. 3 Superseded in 1919	Importation of <i>B. vulgaris</i> and sale thereof prohibited (98, 99).
1918 July 20	Colorado State Entomologist	State Quarantine No. 6 Superseded in 1919	Movement of <i>B. vulgaris</i> into or within the State for- bidden (65).
1918 Sept. 5	Colorado State Entomologist	Order Superseded in 1919	Extermination of <i>B. vul- garis</i> in the State ordered (65).
1918 Sept. 16	Tennessee State Board of Entomology	State Quarantine No. 2 Revised in 1941	All barberry bushes ex- cept <i>B. Thunbergii</i> outlawed ¹³ (138).
1918	Wyoming	State Quarantine No. 3 Revised in 1937	[Copy of original quaran- tine not available either in barberry eradication litera- ture or from State officials.]

¹² See footnote No. 4 on page 491.

Date of Becoming Effective	Promulgating Body	Status	Principal Provisions ¹¹
1918	Nebraska State Council of Defense	Order	Removal of all common barberry bushes ordered (41).
1919 Feb. 10	Iowa General Assembly	State Law Revised in 1927	Eradication of all barberry and mahonia plants, except <i>B. Thunbergii</i> , and of any other alternate host of a dan- gerous plant disease, ordered (145-151).
1919 Feb. 21	Montana State Legislature	State Law Quarantine No. 3 of 1918 superseded; supplemented by Quarantine No. 2A of 1926.	All barberry and mahonia bushes, except <i>B. Thunbergii</i> , outlawed; \$10 to \$25 fine per offense (98, 99, 163-165).
1919 Feb. 27	South Dakota State Legislature	State Law	All barberry and mahonia bushes susceptible to infection outlawed ¹³ (178, 179).
1919 March 21	Minnesota State Legislature	State Law	Destruction of all barberry and mahonia bushes, except <i>B. Thunbergii</i> , ordered (161, 161a, 162).
1919 April 3	Nebraska State Legislature	State Law	Eradication of all suscep- tible barberries ordered and possession thereof declared unlawful (166, 167).
1919 April 10	Michigan State Legislature	State Law Revised in 1927 and 1933	Possession of mahonia bushes or of five specified species of <i>Berberis</i> and their hybrids and varieties declared unlawful (154-159).
1919 May 1	United States Secretary of Agriculture	Federal Quarantine No. 38. Amended in 1923, 1931 and 1937.	Movement of 31 species of <i>Berberis</i> and four of <i>Mahonia</i> out of a quarantined area of 35 States and one District into the remaining 13 States pro- hibited, excepting <i>B. Thun-</i> <i>bergii</i> and material to be used by the U. S. Department of Agriculture for scientific pur- poses (8, 30, 35, 37-39, 71).
1919 May 15	Wisconsin State Legislature	State Law Revised in 1923	All susceptible forms of barberry and mahonia out- lawed (180, 181).
1919 Aug. 20	Illinois Director of Agriculture	Public Notice	Eradication of all <i>B. vul-</i> <i>garis</i> , including horticultural varieties, ordered (138).

¹³ "Outlawed", as used in this article, means that possession of, planting, sale, offer for sale, transportation of, and every other association with the plants is prohibited, under penalty of the law.

Date of Becoming Effective	Promulgating Body	Status	Principal Provisions ¹⁴
1919 Sept.	Colorado	State Quarantine No. 8 Quarantine No. 6 and Order of 1918 superseded; revised in 1928.	Movement of <i>B. vulgaris</i> into or within the State for- bidden and destruction of those in the State ordered. ¹⁴
1919 Nov. 29	Indiana Conservation Commission	Order	Destruction of all <i>B. vul- garis</i> by Dec. 31, 1919, or- dered (138).
1919 Dec. 15	Ohio Department of Agriculture	State Quarantine Third revision in 1939	[Copy of original quaran- tine and of first two revisions not available either in bar- berry eradication literature or from State officials.]
1921 Feb. 22	Wyoming State Legislature	State Law	All barberry and mahonia bushes, except <i>B. Thunbergii</i> , outlawed (183, 184).
1923 Jan. 1	United States Secretary of Agriculture	Federal Quarantine Amendment No. 1 to Fed- eral Quarantine No. 38 of 1919.	<i>Mahonia repens</i> exempted from the provisions of the quarantine (13, 129).
1923 Feb. 14	Oregon State Legislature	State Law Amended in 1939	Growing, propagating or distributing <i>B. vulgaris</i> de- clared unlawful (170, 170a, 171).
1923 May 23	Wisconsin State Legislature	State Law Law of 1919 revised	Minor change (182).
1923 April 18	Minnesota State Legislature	State Law	Land owners or occupants required to destroy all "nox- ious weeds", the list including barberry (161a, 162a).
1923 June 6	Washington State Legislature	State Law	Everyone owning or hav- ing charge of premises sup- porting rust-susceptible bar- berries, ordered to destroy them (179a, 179b).
1926 Oct. 29	Montana Governor	State Quarantine No. 2A Law of 1919 supplemented	Importation of <i>B. vulgaris</i> and sale thereof declared un- lawful (138).
1927 March 24	Iowa General Assembly	State Law Law of 1919 revised	Law made applicable to any plant designated by the State Entomologist as a car- rier of a dangerous plant dis- ease (152).
1927 May 12	Michigan State Legislature	State Law Law of 1919 revised; re- enacted in 1931; further re- vised in 1933.	<i>Mahonia repens</i> , <i>Berberis Thunbergii</i> and three varie- ties of the latter exempted from the law (160).

¹⁴ Copy of original quarantine not available, either in barberry eradication literature or from State officials. Contents as here given arrived at from other evidence.

Date of Becoming Effective	Promulgating Body	Status	Principal Provisions ¹¹
1927	Wisconsin State Department of Agriculture and Markets	Plant Quarantine and Inspection Regulations— Order 1F.	No inspection certificates covering sale or shipment of <i>Berberis vulgaris</i> to be made (138).
1928 March 15	North Dakota Commissioner of Agri- culture and Labor	State Quarantine	Maintenance, planting, propagation, sale or introduc- tion into the State of any rust- susceptible barberry or ma- honia bushes forbidden; those already in the State ordered destroyed; <i>B. Thunbergii</i> and its varieties as well as plants to be used by the U. S. De- partment of Agriculture for scientific purposes, exempted (138).
1928 April 5	Colorado State Entomologist	State Quarantine Quarantine No. 8 of 1919 amended; superseded by State Quarantine No. 3 (Second Series) at undeterminable date; amended in 1942.	(137) [Details not avail- able either in barberry eradi- cation literature or from State officials.]
1931 Aug. 1	United States Secretary of Agriculture	Federal Quarantine Amendment No. 2 to Fed- eral Quarantine No. 38 of 1919.	Quarantine extended to the entire United States by pro- hibiting movement of suscep- tible species between as well as into the protected States (14, 17, 23, 57, 78-80, 124).
1933 July 10	Michigan State Legislature	State Law Law of 1919, revised in 1927, again revised.	Law made applicable to any susceptible bushes; spe- cific mention of exemptions deleted (160b).
1934 Dec.	Missouri State Entomologist	Regulation No. 2	Wheat rust and susceptible barberries placed under the general plant pest law and growing or moving the bushes thus prohibited (28).
1937 Sept. 1	United States Secretary of Agriculture	Federal Quarantine Amendment No. 3 to Fed- eral Quarantine No. 38 of 1919.	Missouri, Pennsylvania, Virginia and West Virginia included in the protected area (15, 20, 118, 120, 133, 134).
1937 Sept. 1	Wyoming Commissioner of Agriculture	State Quarantine No. 3 Quarantine No. 3 of 1918 revised.	Movement within or into the State of all but 31 kinds of <i>Berberis</i> prohibited, and destruction thereof already in the State ordered (33).
1938 Feb. 25	Virginia Commissioner of Agri- culture and Immi- gration	State Quarantine No. 4	Planting and movement of all susceptible forms of <i>Ber- beris</i> and <i>Mahonia</i> through-

Date of Becoming Effective	Promulgating Body	Status	Principal Provisions
1939 June 12	Ohio Director of Agriculture	State Quarantine Third revision of quarantine of 1919.	out the State prohibited; officials authorized to destroy them in 13 specified counties; 31 species and varieties ex- empted (138). Possession, shipment or transportation of susceptible varieties and hybrids of bar- berry and mahonia prohibited (34).
1939	Oregon State Legislature	State Law Law of 1923 amended	Minor change (172).
1940 Jan. 1	West Virginia Commissioner of Agriculture	Regulation No. 3 (revised).	Black stem-rust added to list of officially recognized dangerously injurious plant pests (138).
1940 April 15	Pennsylvania Secretary of Penn- sylvania Depart- ment of Agriculture	State Quarantine No. 25	Growing of or movement within the State of suscep- tible barberries prohibited (138).
1941 June	Tennessee Division of Insect and Plant Disease Control	State Quarantine Quarantine No. 2 of 1918 revised.	Other non-susceptible forms of barberry than <i>B. Thun- bergii</i> and its varieties also exempted from provisions of the quarantine (48).
1942 May 1	Colorado State Entomologist	State Quarantine Quarantine No. 3 (Second Series) amended.	Movement of all except 31 non-susceptible species of <i>Berberis</i> prohibited (138).

Species and Varieties of Berberis and Mahonia Affected by Legislation

In Europe there was only one kind of barberry, *Berberis vulgaris*, sufficiently abundant to have been concerned in rust dissemination and therefore subject to legislative measures. And in colonial New England, only this same species, as a result of its introduction, caused trouble. The two native American barberries were at that time sufficiently removed from wheat-growing areas as not to be of importance—*B. canadensis* of Virginia, West Virginia and limited regions in Illinois, Iowa and Missouri, and *B. Fendleri* of south-western Colorado.

By 1918, however, when present day legislation began, many foreign species had been imported, and it became necessary to de-

termine by means of inoculations whether all of them were susceptible to infection and thus potential spreaders of wheat rust, and if not, just which ones were to be subjected to the provisions of legislation. There are nearly 200 different kinds of barberry and 50 of mahonia, not only known but for the most part in cultivation.

That *Berberis vulgaris*, the common barberry of Europe, is an important host, was realized from the time control efforts were first undertaken, as we have already extensively noted. And that the Japanese species, *B. Thunbergii*, introduced into the United States the latter half of the nineteenth century and since then so extensively grown as an ornamental plant, is immune from infection, was fortunately well recognized before twentieth century legislation was adopted. It was never mistakenly accused in any legal measures of complicity in rust dissemination, but has always received stipulated exemption.

The other barberries and mahonias, or Oregon grapes, as the latter are also known, have been tested on several occasions and have been classified on the basis of susceptibility, in connection with the Rules and Regulations accompanying the Federal quarantine (3, 72, 73, 114-117, 119), and elsewhere (45, 46, 54, 96, 112). On a few occasions it has been found necessary to reclassify certain species as their susceptibilities became better known, and today about 100 species, varieties and hybrids, including our two native species, are regarded as susceptible to infection and therefore dangerous hosts. Under the Federal quarantine, which is the principal legal control in the entire problem, none of these forms may be shipped either into or between any of the 17 protected States.

Despite this indictment, which would seem to remove the entire genus from interstate trade in the wheat areas, there are 21 kinds of *Berberis* and three of *Mahonia* known to be either immune from infection or so resistant that their presence is not regarded as dangerous. They may be moved between and into the protected States, but only under permit, and are (40):

EVERGREEN

Berberis buxifolia
candidula
Chenaultii
Darwinii
Gagnepainii

DECIDUOUS

Berberis aemulans
Beauviana
circumserrata
concinna
dictyophylla var. *albicaulis*

EVERGREEN	DECIDUOUS
<i>Julianae</i>	<i>Edgeworthiana</i>
<i>sanguinea</i>	<i>Gilgiana</i>
<i>Sargentiana</i>	<i>koreana</i>
<i>stenophylla</i>	<i>mentorensis</i>
<i>triacanthophora</i>	<i>Potanini</i>
<i>verruculosa</i>	
<i>Mahonia Aquifolium</i> (<i>B. diversifolia</i>)	
<i>nervosa</i>	
<i>repens</i>	

Free from all control are *B. Thunbergii* and its varieties *atropurpurea* (*purpurea*), *Maximowiczii*, *minor*, *pluriflora* and *pluriflora erecta*; they may be grown and shipped anywhere in the United States without restriction.

Beneficial Results of Legislation

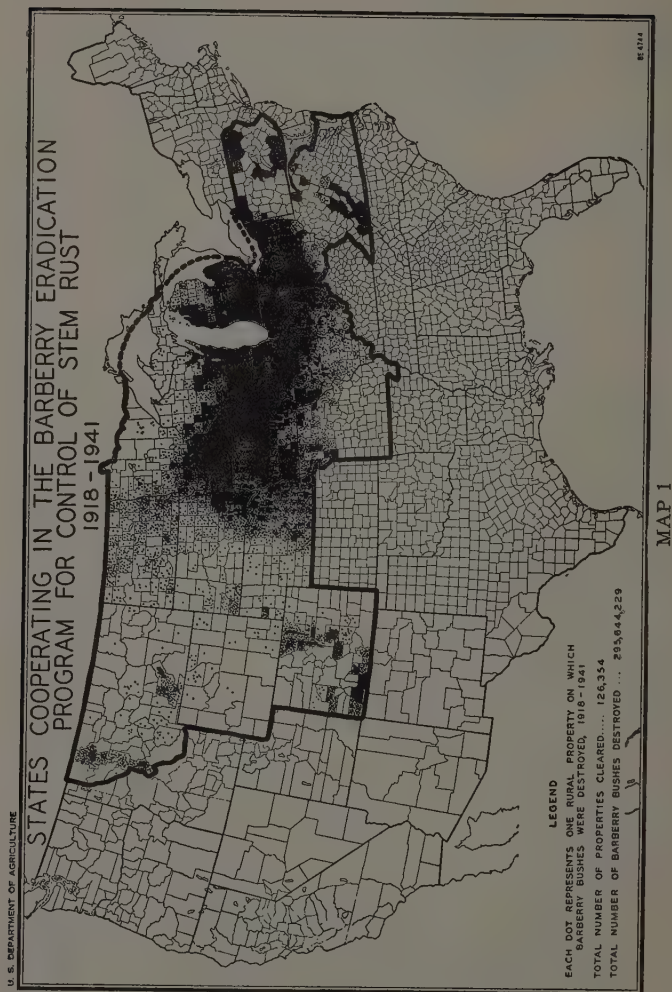
The probability has been recognized that "in the diversity of its far-reaching effects and in the magnitude of the values involved no pest control project ever undertaken compares with the attempt to control black stem-rust of grains" (61). The great magnitude of this undertaking lies in its endeavor to eradicate from 964,000 square miles of land (137), millions of plants of a vigorously growing, strongly rooting and prolifically self-perpetuating shrub. Perhaps if this alternate host had been an inconspicuous, herbaceous, lowly herb rather than an upright and comparatively bulky shrub, and had taken possession of the Central States as crab-grass does of our lawns, eradication measures might have appeared so futile as never to have been undertaken. All hopes would then have been confined to breeding resistant strains of wheat, but not with any greater assurance of success, for so long as barberry bushes are present, new physiologic races of the fungus, capable of attacking improved resistant varieties of grain, may evolve.

At the beginning of the black stem-rust control program, eradication measures adopted against barberry worked some hardship, particularly on nurserymen who happened to have large stocks of rust-susceptible plants. One nursery in Illinois, for example, eliminated 2,500 plants from their stock, another in Iowa destroyed 50,000 of the susceptible purple-leaved variety, and a third in Minnesota in the spring of 1918 destroyed 598,000 plants, most of which were probably seedlings. However, most of the barberries destroyed in the eradication work were ornamental plants or bushes that had escaped from cultivation, and, in general, their removal did not result in any real hardship for the owners. The desire to avert recurrence

of devastating losses from stem rust, such as occurred in 1916, and the need of wheat, oats, barley and rye for food during the first World War were largely responsible for the excellent cooperation shown by the public in giving up their susceptible barberries to assist in controlling this destructive plant disease. In Omaha, Nebraska, for instance, 25,000 bushes were destroyed, and civic cooperation elsewhere gave further impetus to the campaign.

While these sacrifices are impressive, their beneficial effects were naturally very localized, though they did of course remove from distribution just so many shrubs as were destroyed. The really significant results were those achieved through the cooperative efforts of Federal, State and local agencies as well as individuals in the States constituting the eradication area. The literature of barberry eradication is replete with progress reports of this work, but it suffices for our purpose to note that from 1918 through June 30, 1942, 309,645,502 planted, escaped and seedling bushes of *Berberis vulgaris*, *B. canadensis* and *B. Fendleri* were destroyed in the eradication area. About 60% of the entire area is today practically free from barberry bushes; 13% has widely scattered infestations necessitating at least one more resurvey; and the remaining 27% represents areas where limited local reinspections may be necessary to remove any bushes that have become established from seeds or sprouts (137). According to the 1942 annual report of the chief of the Bureau of Entomology and Plant Quarantine, the ultimate benefit has been a reduction of about 60% in the amount of wheat, oats, barley or rye destroyed by the rust in the 17 States, representing an estimated annual saving to grain growers of about \$25,000,000 (46a). It must be recognized, however, that some of the most severe outbreaks of rust have developed after the barberry eradication campaign was far advanced (113a). Millions of bushels are still annually lost through the disease and only continued vigilance will maintain the gains already achieved and augment their benefits.

The area covered by this Federally sponsored phase of eradication is shown in the following map, printed here by permission of the U. S. Bureau of Entomology and Plant Quarantine. All States within the area, as well as Oregon, Tennessee and Washington outside the area, have their own regulations in addition to any Federal jurisdiction.



LITIGATION

Barberry legislation has been subjected to the scrutiny of a higher court on only one occasion, so far as the author has been able to determine, though other instances of violation wherein the defendants have pleaded guilty and paid stipulated fines without appeal are also recorded. The latter possess little interest from the historical viewpoint of this review, and their rôle in the evolution of jurisprudence respecting plant eradication is negligible. For these reasons they are not considered in this study.

It was in Iowa, in connection with the State barberry law, that the Supreme Court of the State was called upon to pass judgment upon the constitutionality of the statute and to adjudicate other issues raised in connection with it. The situation arose in 1919 and not until 1923 was the matter finally settled. The trouble began in the former year when an assistant to the State entomologist, entrusted with enforcement of the law, discovered a single bush of common barberry on a certain parcel of private property. In the discharge of his duties and under the provisions of the law he requested permission of the owner to remove the shrub, and when such permission was refused he served notice that if the shrub were not eradicated within ten days, he was authorized to remove it. At the expiration of that period the shrub had not been removed by the owner and the deputy entomologist thereupon attended to the matter himself.

The owner was much disturbed by this action and invited the entomologist to explain his performance. Thereupon followed abusive language and a brawl with shedding of blood. The owner, now all the more indignant, then brought suit against the agent for trespass and for damages to property and person. He charged in court that the statute authorizing removal of barberry bushes, under which the agent had acted, was unconstitutional, for it involved, so he claimed, the taking of property without due process of law. Furthermore, according to his charge, the bush under consideration was the harmless Japanese barberry, it had been purchased as such from a reputable nursery, and the State Entomologist or his assistants were not in a position to testify upon a botanical matter involving the identity of the plant.

The trial court was unimpressed by these pleas and rendered judgment in favor of the State officials. Still dissatisfied, the owner

appealed to the Supreme Court of the State and there the ruling of the lower court was upheld. The law was declared constitutional primarily on the basis of a decision in Kansas upholding the law of that State in which entomologists were authorized, in combating San José scale, to destroy infected trees. The right of the entomologist to testify with respect to the shrub was also upheld and his testimony accepted, for the owner failed to produce any evidence to the contrary. His claim against the agent for trespass and damage was thus dismissed and legal precedent for further enforcement of the law established (185).

II. CURRANT AND GOOSEBERRY

INTRODUCTION

At the beginning of the twentieth century, ideas of forest conservation and of replenishment of natural timber resources in America had developed to such a degree that extensive planting operations were undertaken as part of a general reforestation movement. The activity developed especially in the northeastern and north central States and was concerned particularly with coniferous trees, especially the native eastern white pine, *Pinus Strobus*. This was the great timber tree of the Northeast and had been the backbone of the early American lumber industry.

The demands for young planting stock needed in this movement led to establishment of numerous forest-tree nurseries, but the requirements became so great that domestic nurseries had difficulties in meeting them. Attention thus became directed toward possible foreign sources, however ironical it may have seemed to look abroad for American white pine seedlings with which to stock the great and once thought inexhaustible American forests.

In addition to the inability of American nurseries to meet local demands, other factors also directed attention abroad. American prices were considerably higher than those prevailing in Europe for the same grades of stock because manual labor in America was more costly than in Europe and inefficient methods of American nurserymen made their operating expenses high.

Nurseries in Germany, France and Holland at that time were more successfully managed and were producing thrifty planting stock in the hundreds of millions at relatively low prices as compared with similar American stock. American nurserymen gradually turned

to them and in the spring of 1909 probably ten million coniferous seedlings were imported from European nurseries (118).¹⁵

Importation of foreign stock always carries the liability of also introducing foreign diseases. This has occurred in a number of instances with respect to a variety of diseases, and in Europe at the time of these white pine importations, there was the blister-rust disease of five-needle pines caused by the fungus *Cronartium ribicola* which had good chances of so being introduced into America. The disease had long been known in Europe where it had caused damage to cultivated five-leaved pines. Its depredations there were well known to plant pathologists in America and its introduction here was feared by them. For years they were on the lookout for it, especially since development of the enlarging import trade in coniferous seedlings.

Like black stem-rust of wheat, the disease was known to be caused by a heteroecious fungus. Five-leaved pines constituted one type of host, currants and gooseberries the other. This relationship had been established in 1888 (91), but the discovery at that time did not have the significant practical implications in Europe which de Bary's discovery of heteroecism in wheat rust, twenty years earlier, had, because the hosts of blister-rust in Europe were not of such great economic importance as was wheat. In America, however, five-needled pines were of paramount timber value, and the forest resources of a nation were thus open to what was feared might develop into a devastating scourge.

This foreboding was well founded and the vigil of American nursery inspectors and phytopathologists was not in vain, for in 1905 the disease was discovered at Dresher, Pennsylvania (107),¹⁶ and the next year at the New York State Experiment Station at Geneva, N. Y. (122), in both instances on leaves of *Ribes*. The phase on pines was not found. Sixteen years earlier, in 1892, a disease had been noted in Kansas, also on *Ribes*, which in 1907 was identified as *Cronartium ribicola* (63) but later was found to be the native pinon rust, *C. occidentale*, having pinon pine and *Ribes* as alternate hosts.

¹⁵ Currant and gooseberry citations are on pages 582-589 of the bibliographies.

¹⁶ The Bureau of Entomology and Plant Quarantine regards this report as incorrect and believes that the rust was first reported from Geneva in 1906. They say, however, that "Mr. R. G. Pierce, Pathologist, Grace American Bldg., Richmond, Va., located a pine canker from a nursery outside of Philadelphia, that had been sent to the Mycology Office, Plant Industry, in 1905, and published a note on it as being *Cronartium ribicola*".

It was not until 1909, however, that the stage was set for really serious development. That year several million white pine seedlings were imported from the nursery of J. Hein Söhne, Halstenbeck, Germany, which were distributed to 226 localities in America (119). The next year other importations came from France. Among them all were seedlings infected with the blister-rust fungus, and by 1911 the diseased stock had been distributed in New Hampshire, Vermont, Massachusetts, Connecticut, Pennsylvania, Indiana and Ohio. An attempt was made to destroy these diseased imported trees but was given up in 1915 when the rust was first reported attacking native white pines in Massachusetts and other States.

The numerous unrestricted introductions of infected trees and their distribution in plantations of the country caused much concern among foresters and others who gave thought to the matter, for the disease threatened not only the white pine forests of the Northeast, but also, should it spread to the West, the great pine forests of that vast area. It was known to affect all five-needled or white pines which included, of course, western white pine, *Pinus monticola*, and sugar pine, *Pinus Lambertiana*, two of the important timber trees in western North America.

Here, certainly, was a situation to be combated, and the law was again called upon to assist. The initial move was made by the nursery inspector of Massachusetts in 1912. A federal quarantine followed a few months later. On Nov. 14, 1914, Canada instituted a quarantine against all white pines from all foreign countries (121). Since then a body of laws and regulations has been evolved in the United States two or three times as voluminous as that concerning barberry. For the benefit of nursery inspectors these have been summarized on several occasions (6, 10, 35, 47-49, 72, 110, 111, 121). Historically and categorically considered they line up as follows.

LEGISLATION

Federal Quarantines. On August 20, 1912, Congress passed the so-called "Plant Quarantine Act", and less than a month later the Acting Secretary of Agriculture issued Federal Quarantine No. 1 under the provisions of this act. The fact that this first quarantine issued so soon after adoption of the enabling legislation dealt with white-pine blister-rust betrays the concern which was developing at that time with respect to this disease and the necessity for combating possible additional introductions of it into the country. To

this end the quarantine forbade importation into the United States of *Pinus Strobus*, *P. monticola*, *P. Lambertiana* and *P. Cembra* from Great Britain, France, Belgium, Holland, Denmark, Norway, Sweden, Russia, Germany, Austria, Switzerland and Italy. Thus the three important five-needled pines of the United States were prevented from entering their native land for fear of having contracted a dangerous and communicable disease abroad, and in addition to them one of the two five-needled pines native to Europe and known to be subject to infection was also excluded (119, 121, 136).

It was soon realized that this quarantine was not sufficiently broad to bring about its primary end, for other sources of introduction were omitted from its provisions. Therefore, the very next year it was superseded by Federal Quarantine No. 7 which prohibited importation of any five-needled pines from any country of not only Europe but also Asia (136).

There still remained sources of infection nearer home but they were not excluded until 1916 when, by an amendment to Quarantine No. 7, importation of all five-leaved pines from Canada and New Foundland was prohibited along with all forms of *Ribes* and *Grossularia*, except for experimental use by the United States Department of Agriculture (136). The next year by a second amendment this restriction on currants and gooseberries was extended to Europe (37, 84, 109).

On the basis of information available at the time and in view of the numerous introductions of the disease from foreign sources as well as the known limited distribution of the disease in this country up to 1917, a barrier was thus built up against five-leaved pines, currants and gooseberries from Europe, Asia, Canada and New Foundland. Quarantine No. 7 and its two amendments served this purpose until 1936 when they were revoked. Federal Quarantines Nos. 37 and 63 (20, 82, 124) had been enacted in the meantime, and by revocation of Quarantine No. 7, entry of white pines, currants and gooseberries automatically was placed under the provisions of Quarantine No. 37. This made it possible to regulate their entry in harmony with Quarantine No. 63 which controlled domestic movement of the host plants. With respect to importation, the policy thus changed from prohibition to importation under permit. This change was justified by increased knowledge on the distribution of the disease in this country and on the factors necessary for

its establishment. Under certain conditions, it was realized, importation might be permitted without risk of spreading the disease to new localities. Quarantine No. 37, first effective on June 1, 1919, does not mention currants, gooseberries or white pines as such, but, with certain exceptions, excludes all foreign nursery stock except for experimental purposes by the U. S. Department of Agriculture, and the plants under consideration are not among the exceptions. Quarantine No. 63 will be discussed later.

Foreign sources of infection were thus guarded against, but domestic spread of the disease was a more immediate problem. An appeal was made to eastern nurserymen asking them not to send white pine, gooseberry or currant stock into the Rocky Mountain and western white pine areas (95). As was true a few years later in connection with a similar appeal respecting shipment of barberry bushes, this effort to secure voluntary cooperation was in vain. Therefore, on the same date on which the second amendment was made to Quarantine No. 7, a separate quarantine, No. 26, was promulgated to cope with the home front by attempting to prevent artificial spread of the rust from the East to the West in shipments of diseased host plants. This quarantine prohibited movement westward of five-leaved pines, currants and gooseberries from all States east of and including Minnesota, Iowa, Missouri, Arkansas and Louisiana. Interstate movement of the plants within the designated area was permitted. The quarantine, as originally adopted, was to become effective on June 1, 1917, but when the Federal Horticultural Board learned of a considerable movement under way of possibly infected white pines and to a less extent of black currants from New England to States lying west and south, the date of becoming effective was advanced to May 1 (39) and the additional restriction imposed that white pines and black currants be not moved out of New England and New York (37, 85). This establishment of a smaller quarantined area within a larger quarantined area was made in order to prevent spread of the disease from the most infested part of the country, the Northeast, into the great central portion of the country which, in addition to its also being quarantined, would then not be exposed to further infestation.

It was hoped that by means of these quarantines, domestic and foreign, the white pine timber of the western United States would be isolated from all sources of infection. The hope was but wishful

thinking, however, for in 1921 the rust was found on planted white pine at Van Couver, British Columbia, and on cultivated black currants at several other points in that vicinity. Shortly thereafter it appeared in two places in the northwestern corner of Washington. These infections on the Pacific Coast were caused, not by any miraculous spread of the spores from Minnesota, where the disease had supposedly reached its western limit at that time, or by violation of Quarantine No. 26, but by importation in 1910 with nursery stock from France. The State of Washington very soon imposed two State quarantines, in 1921 and 1922. The second of these must be considered at this point because an amendment in it led to an amendment in the next Federal quarantine. The State quarantine, as originally enacted, prohibited shipment of all kinds of five-leaved pines and of all *Ribes* and *Grossularia* within or from that part of the State which lay west of the Cascade Mountains, where the infestations had been found, through or into the rest of the State. This was done to protect the western white pine forests of northeastern Washington, northern Idaho and northwestern Montana, which were free of the disease at that time. In addition, and in order to delay spread of the disease, all English black currants, *Ribes nigrum*, in ten counties bordering on Puget Sound were ordered destroyed (78).

Two weeks later that "next" Federal quarantine, No. 54, was adopted (15, 29, 53, 57). It forbade movement of 15 species of white pine¹⁷ and of all currant or gooseberry bushes out of the State of Washington, but, in view of the previously enacted State quarantine, the provisions of this Federal restriction applied only to the infested areas of the State which were west of the Cascades. A few months later, however, undoubtedly as a result of pressure from nursery interests, the State quarantine was modified so as to permit intrastate movement of all currants (except *Ribes nigrum*) and gooseberries from licensed and inspected nurseries (60a, 133). This relaxing of regulations by the State left its control over the spread of the disease inadequate to cope with the situation, in the opinion of the Federal Secretary of Agriculture, and he thereupon issued an amendment to the Federal quarantine to the effect that it apply to the entire State (5, 11). That is, white pines, currants and gooseberries, thereafter, could not be moved from any part of the State into any other State.

¹⁷ Listed on page 538.

It still remained necessary to adopt some measure toward keeping the rust out of the native white pine areas of the country where it was not known to be, as long as possible, in order to supplement the control work being carried on in cooperation with the affected States. This was done in 1926 by way of Federal Quarantine No. 63 which deals with the interstate aspects of the problem (24, 113). By it, every State and the District of Columbia are quarantined, and all interstate movement of currants, gooseberries and 15 kinds of white pine,¹⁷ except in accordance with prescribed rules and regulations, is prohibited. These rules and regulations have undergone several revisions since their first formulation. Some of them, beyond our immediate interest, govern shipping instructions and the securing of permits; others, more pertinent to the viewpoint of this study, emphasize the recognition which has had to be accorded to the biological nature of the plants concerned. They are (40):

- a) Restrictions on pines apply to "entire plants with roots".
- b) Restrictions on *Ribes* and *Grossularia*, other than *R. nigrum*, apply to "plants, cuttings, or scions".
- c) Restrictions on *R. nigrum* apply to "plants, cuttings, stocks, scions, buds, fruits, seeds, or parts of plants".
- d) Interstate movement of five-leaved pines out of an infected State or District¹⁸ is allowed only under permit.
- e) Interstate movement of five-leaved pines from any State or District permitted only under nursery inspection certificate.
- f) Interstate movement of rootless and visibly uninfected parts of five-leaved pines is permitted without restriction; if visibly infected, they must be shipped in a preservative. Visibly infected rooted plants must also be in a preservative if shipped.
- g) Federal pine-shipping permits will be issued only, among other conditions, if the five-leaved pines to be moved have been "grown from seed in a location within one mile of which there have existed since the time of planting such seed, no European black currant plants and within at least 1500 feet of which there have existed since the time of planting said seed no currant or gooseberry plants of any size or variety which in the judgment of the inspector would involve risk of the spread of the white-pine blister rust".

¹⁸ Designated by the Secretary of Agriculture to include New England, New York, New Jersey, Pennsylvania, Maryland, Virginia, West Virginia, District of Columbia, Ohio, Iowa, Michigan, Minnesota, Wisconsin, Montana, Idaho, Washington and Oregon.

h) Interstate movement of the European *R. nigrum* and the native western *R. bracteosum* and *R. petiolare* is permitted only into or within Alabama, Arkansas, Florida, Kansas, Louisiana, Mississippi, Missouri, Nebraska, North Dakota, Oklahoma, South Dakota and Texas.

i) Interstate movement of any currant or gooseberry plants is permitted only either after they have been dipped (except the roots) in lime-sulphur solution, or in a dormant and defoliated condition.

Federal Act. In 1940 President Roosevelt signed a bill passed by Congress "for forest protection against the white-pine blister rust, and for other purposes". It provided legislative authority for blister rust control and was designed to promote stability of white-pine forest-using industries, employment and communities by assuring a continuous supply of white- and sugar-pine timber, and for this purpose the Secretary of Agriculture was authorized to take measures toward preventing spread of the rust to and eliminating it from all forest lands, irrespective of their ownership. The act provides, however, that this work may not be pursued on private or State lands until funds at least equal to the federal appropriation for those areas shall have been contributed by the State, county or other local authorities. Furthermore, no part of the appropriations may be used to pay for property injured or destroyed (171). The importance attached to this latest piece of federal legislation is evidenced by the appropriation of \$1,949,000 which was made for the fiscal year 1943 toward carrying out its purposes (137).

State Laws. From 1917 to 1937 eleven States enacted laws especially designed to control white-pine blister-rust, partly by imposing prohibitions on their citizens and partly by providing the necessary legal authority for officials to pursue control work—Maine (147, 148), New Hampshire (13, 156–160), Rhode Island (167–169), New York (161), Connecticut (142–146), Massachusetts (148a–c), Oregon (52, 163, 164), California (138–141), Minnesota (151, 152), Michigan (149, 150) and Pennsylvania (165, 166, 166a), named in the order of their laws becoming effective.

In Maine the Forest Commissioner is authorized to organize control efforts and to establish quarantines and control areas wherein currant and gooseberry bushes and infected white pines must be destroyed by the owners. Compensation is provided only for authorized destruction when necessary of uninfected plants. The

commissioner, furthermore, is empowered to prohibit introduction of white pines, currants or gooseberries into the State (147, 148). In 1917, 1927 and 1930, as will be noted later, such State quarantines were issued, establishing control areas.

New Hampshire (13, 156, 158) has authorized its State Forester to establish blister-rust control areas and to remove from those areas any currant or gooseberry bushes and infected white pines if the owners do not do so themselves. Such areas were set aside in 1917, 1918 and 1928. Cultivation of the mentioned plants in those regions may be pursued only under permit, and compensation is provided for in cases of authorized and necessary removal of uninfected trees and shrubs. Entry into the State or movement therein of any five-leaved pine or *Ribes* may be prohibited, and by a short amendment in 1919 this provision was extended to "the products thereof" (156, 157, 159). By another amendment, made in 1929, towns may be compelled to spend up to \$400 annually in eradication work on public lands (160).

The Rhode Island State Board of Agriculture is authorized in various ways to control currant and gooseberry bushes and to remove infected white pines. Such measures were adopted in 1919, 1928 and 1936, as we shall later note. Provision is made in the law for compensating owners for uninfected trees and shrubs having to be removed by the authorities. A fine of \$25 is prescribed in convictions of wilful non-cooperation, and up to \$100 for transporting five-leaved pines and *Ribes* within the State contrary to regulations (167-169).

In 1917, the same year in which the foregoing States adopted their laws, New York augmented its Conservation Law of 1911 by adding to it a provision designed to arrest spread of blister rust in the State (161). With one exception, noted next, this provision outlawed *Ribes nigrum*, *R. odoratum* and *R. aureum* throughout the State. At the same time, this law was the first to officially recognize that in some areas currant bushes might be more valuable than white pines and in such instances should be the alternate hosts to benefit by legislation. Authority was accordingly given for establishing commercial "fruiting currant districts" wherein white pines might be prohibited, and diseased currants and gooseberries destroyed with fair compensation for the latter two. In these districts, to be reserved for cultivation of currants, undiseased *R. nigrum* was

exempted from the general ban against *Ribes*. Outside such fruiting currant districts the Commission was empowered to remove any white pines, currants or gooseberries which it might regard as necessary, except in nurseries annually certified to be free from the disease. The Commission, furthermore, was empowered to establish quarantine districts anywhere in the State for the protection of pines, wherein it might outlaw any white pine and currant and gooseberry bushes as thought necessary. Such areas were established the same year (110). Finally, the law stipulated that fair compensation be paid for any trees or bushes destroyed.

Four amendments were subsequently made to this law. In 1925 uninfected as well as diseased *Ribes nigrum* in the fruiting currant districts was made subject to destruction (161). In 1926 landowners were required to remove currant and gooseberry bushes from within 900 feet of protected white pines on land of adjoining owners. Compensation became limited to white pines and cultivated *Ribes* and *Grossularia* in lieu of applying generally to plants destroyed (161). In 1929 all compensation for destroyed diseased currants and gooseberries was cancelled and the antithetic provision made that owners are liable to charges for destruction by the authorities of bushes which the owners neglect to destroy (161). By the last amendment, in 1930, *Ribes odoratum* and *R. aureum* were exempted and no longer outlawed (161).

In Connecticut the Director of the Agricultural Experiment Station is given authority to investigate and take measures to control the disease in the State. All infected white pines and wild, abandoned or escaped currant and gooseberry bushes may be uprooted and destroyed, and a fine of \$10 to \$50 imposed on anyone who hinders the work. Annual appropriations of \$7,500, according to the original law, were to be made for carrying on the work (8, 142-146). While this law, in its original form, gave the designated authorities the legal right to pursue their work on private property, it became necessary to clarify this aspect by an amendment in 1927 to the effect that cultivated as well as wild and escaped currants and gooseberries are under the ban of the law (142, 145). Two years later another law was passed by which it became unlawful, subject to a fine of \$5 to \$25, to "grow, plant, propagate, cultivate, sell, transport or possess any plant, root or cutting of the European black currant, or *Ribes nigrum*" (142, 146).

Massachusetts gave its nursery inspector authority to destroy both infected and uninfected white pines, currants and gooseberries, according to his judgment, and \$50,000 expenditures were allowed him for suppressing the rust (148a).

Mention should be made at this point of the Nebraska law of 1919, though it did not apply specifically to blister rust. It was directed, as we have already noted in connection with wheat rust, against barberry, but it was applicable also to "any plant which acts as a host of a dangerous plant disease", and so could be applied to currants, gooseberries and white pines, as well as to apples and red cedars, as will be noted later.

Oregon in 1923 made it unlawful to grow, propagate or distribute *Ribes nigrum* or *Berberis vulgaris*, subject to a \$100 fine (52, 163, 164).

California made it unlawful in 1927 to grow, propagate or distribute *Ribes nigrum* (138), and in 1933 this was replaced by an almost identical provision in the Agricultural Code (139-141).

The laws of Minnesota (12, 151, 152), Michigan (149, 150) and Pennsylvania (165, 166), enacted in 1929, 1929 and 1933 respectively, were formulated in considerable detail. Their essential features can best be given in the following itemized manner:

a) The authorized enforcing agencies are empowered to destroy any diseased white pines, currants and gooseberries, and any uninfected plants when necessary.

b) Cultivated black currants are outlawed.

c) The Commissioner is authorized to establish control areas for the protection of either white pines or currants and gooseberries, according to which is the more important, in Michigan and Pennsylvania. Such areas for protection of currants are not recognized in the Minnesota law. Under this provision Pennsylvania set aside two control areas for protection of pines but none in favor of currants.

d) Compensation is provided for in the necessary destruction of uninfected cultivated pines, currants and gooseberries, but not of wild plants.

State Quarantines. While some of the foregoing State laws are quarantines *per se* in the broadest sense of that term, others are only enabling statutes, so far as quarantines are concerned, authorizing promulgation of them by some official or group of officials. At various times from 1916 to 1938 such quarantines have been issued

in the following States, in the sequence given, in their efforts to control blister rust:

Idaho	1916	Pennsylvania	1917	Illinois	1917
Wisconsin	1916	Indiana	1917	Tennessee	1918
Montana	1916	Michigan	1917	New Hampshire	1918
Oregon	1916	South Dakota	1917	Rhode Island	1919
California	1917	Maine	1917	Washington	1921
Ohio	1917	Maryland	1917	New Mexico	1926
Delaware	1917	New Jersey	1917	Wisconsin	1927
South Carolina	1917	West Virginia	1917	Virginia	1934
New York	1917	Minnesota	1917	North Carolina	1934
Kansas	1917	Georgia	1917	California	1938
Nevada	1917	Vermont	1917		

In some of the States these quarantines supplement State blister-rust laws; in others they embody the only blister-rust control efforts of those States. Their provisions include outlawing of currants and gooseberries, prohibition of their importation or of that of five-leaved pines, and establishment of control areas. On June 1, 1942 there were in effect interstate quarantines in New Hampshire, Tennessee and Montana, and intrastate quarantines in New Hampshire, New York, New Jersey, Pennsylvania, Maryland, Virginia, West Virginia, Ohio, Michigan, Wisconsin, Minnesota, North Carolina, California and Idaho.^{9a} In the summary beginning on page 525 the essential features of all the quarantines are stated.

Departmental Orders. Departmental orders, other than quarantines, have been issued by Massachusetts, New Hampshire, Rhode Island, Virginia, Minnesota, North Carolina, Ohio, Maryland, Wisconsin, New York, New Jersey and Illinois. In addition, the Central Plant Board, consisting of the State Entomologists and other plant quarantine officers of Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota and Wisconsin, in 1939 made a recommendation which was adopted by all the States involved.¹⁹ That recommendation stipulates that "the movement of white pine shall be permitted between infected States only from nurseries that have established sanitation *Ribes*-free zones of 1,500 feet, and in the case of cultivated European black currant of one mile as previously required by Federal regulation, into those States maintaining such sanitation zones around their own nurseries growing white pine, and that nurseries desiring to make such shipment file an affidavit to this effect with their certificate" (21a).

¹⁹ According to a communication from E. L. Chambers, State Entomologist of Wisconsin.

Blister-rust Control Areas. A feature of blister-rust legislation, absent from that associated with barberry, is the establishment of control areas, already frequently mentioned in this paper. These areas are delimited regions within States—towns, counties or smaller units—surrounding valued stands of white pine, to which quarantines are made applicable rather than to an entire State, and within which currants and gooseberries are not permitted to exist, except under permit in some States. This practice is based on the premise that the spores which carry the disease from currants and gooseberries to pines are viable only for very short periods and over short distances of natural dissemination. This distance has been found to be about one thousand feet, and in some regulations, accordingly, the shrubs may not be closer than 900 feet to the trees to be protected.

By 1939 the following 20 States had established such control areas by making quarantines and other regulations applicable to only a part of their domains (42, 93):

New York	1917	Connecticut	1928	Pennsylvania	1936
New Hampshire	1917	Minnesota	1933	Wisconsin	1937
Rhode Island	1919	West Virginia	1934	Michigan	
Washington	1922	Virginia	1934	Vermont	
Idaho	1927	North Carolina	1935	California	1938
Maine	1927	Ohio	1935	New Jersey	1938
		Maryland	1935	Illinois	1939

At the end of 1942 these areas included over 28,000,000 acres of land, and more than two-thirds of this acreage had been initially protected by eradication of *Ribes* and about one-fourth had been reworked one or more times to maintain control of the disease (62).

While all these areas have been set apart for protection of white pines by banishing currants and gooseberries in them, recognition has been given in four States to the possibility that currants and gooseberries in certain localities may be more valuable than pines. In these States, New York, Michigan, Tennessee and Pennsylvania, so-called fruiting currant districts may be established wherein white pines are to be banished. Only New York has carried out such a provision, as we have noted in discussing the State law of that State.

Summary. Beginning with the nursery inspector's ruling of Massachusetts in 1912 and terminating with adoption in 1941 by Tennessee of a revised quarantine, the Federal government and 33 States have enacted laws, quarantines and regulations in an effort to control white-pine blister-rust. Chronologically considered, all the legislative measures appear as follows:

CHRONOLOGICAL SUMMARY OF FEDERAL, STATE AND DEPARTMENTAL
LEGISLATION AND REGULATIONS RESPECTING ERADICATION
AND QUARANTINE OF CURRANTS AND GOOSEBERRIES
AND CONTROL OF WHITE-PINE BLISTER-RUST²⁰

Date of Becoming Effective	Promulgating Body	Status	Principal Provisions
1912 June 1	Massachusetts Nursery Inspector		Importation from Europe of five-leaved pine stock for- bidden (119, 121, 136).
1912 Sept. 16	United States Secretary of Agriculture	Federal Quarantine No. 1. Superseded in 1913	Importation into the United States from 14 European countries of four five-leaved species of pine and their hor- ticultural varieties forbidden (119, 136).

²⁰ The following appropriate comment on this summary was received from the Bureau of Entomology and Plant Quarantine:

"This chronological summary does not include reference to the various Acts which provide appropriations to the U. S. Department of Agriculture which provide funds and the legislative authority for the work directed toward control of white pine blister rust. The situation here is similar to that referred to on barberry eradication. It differs, however, in one important respect, namely, the enactment of general authorizing legislation for white pine blister rust control. This is discussed further below. Apparently the first Federal Appropriation Act authorizing eradication of ribes as a means of controlling white pine blister rust was that provided in the Urgent Deficiency Appropriation Act approved February 28, 1916. The Annual Appropriation Act for the fiscal year 1917 includes the following language in the item for forest and ornamental tree diseases under the then Bureau of Plant Industry:

Provided, That the unexpended balance of the appropriation of \$20,000 for the emergency caused by the infectious nature and continued spread of the destructive disease of pine trees known as the white-pine blister-rust, by conducting such investigations of the nature and means of communication of the disease, and by applying such methods of eradication or control of the disease as in the judgment of the Secretary of Agriculture may be necessary, made in the further urgent deficiency Act approved February twenty-eighth, nineteen hundred and sixteen, is hereby reappropriated and made available for the same purpose for the fiscal year nineteen hundred and seventeen;"

Another example is the legislation authorizing uses of funds and providing authority for such work for the fiscal year 1936, the first fiscal year this item was included under Salaries and Expenses, Bureau of Entomology and Plant Quarantine:

"Blister rust control: For applying such methods of eradication, control, and prevention of spread of the white pine blister rust as in the judgment of the Secretary of Agriculture may be necessary to accomplish such purposes, and in the discretion of the Secretary of Agriculture no expenditures shall be made for these purposes until a sum or sums at least equal to such expenditures shall have been appropriated, subscribed, or contributed by State, county, or local authorities, or by individuals or organizations concerned, \$250,000: *Provided*, That no part of this appropriation shall be used to pay the cost or value of trees or other property injured or destroyed."

Date of Becoming Effective	Promulgating Body	Status	Principal Provisions
1913 May 21	United States Secretary of Agriculture	Federal Quarantine No. 7. Superseded Federal Quar- antine No. 1 of 1912; amended in 1916 and 1917; revoked in 1936.	Importation into the United States of all five-leaved pines from all countries in Europe or Asia forbidden (136).
1916 March 1	Idaho	State Quarantine	Importation of all white pines and all currant and gooseberry bushes from New Hampshire, Vermont, Massa- chusetts, Connecticut, New York and Pennsylvania pro- hibited (121).
1916 March 16	United States Secretary of Agriculture	Federal Quarantine No. 1, amended. Amendment No. 1 to Federal Quarantine No. 7 of 1913; further amended in 1917; re- voked in 1936.	Importation into the United States from Canada and New Foundland of all five-leaved pines and all forms of <i>Ribes</i> and <i>Grossularia</i> , except for scientific purposes by the U. S. Department of Agricul- ture, forbidden (83, 136).
1916 June 1	Wisconsin	State Quarantine	Importation of <i>Pinus Stro- bus</i> , <i>P. monticola</i> , <i>P. Lam- bertiana</i> , <i>P. Cembra</i> and <i>P. excelsa</i> prohibited; <i>Ribes</i> not quarantined (121).
1916 July 17	Montana	State Quarantine Amended in 1917	Importation of all white pines and all currant and gooseberry bushes from New Hampshire, Vermont, Massa- chusetts, Connecticut, New York and Pennsylvania pro- hibited (121).
1916 July 24	Oregon	State Quarantine	Importation of all five- leaved pines and all currant and gooseberry bushes from east of the Mississippi River and from all foreign countries prohibited (121).
1917 Feb.	California	State Quarantine	Importation of all white pines and all currant and gooseberry bushes from east of the Mississippi River pro- hibited (121).
1917 Feb. 21	Ohio	State Quarantine	Importation of <i>Pinus Stro- bus</i> , <i>P. monticola</i> , <i>P. Lam- bertiana</i> , <i>P. Cembra</i> , <i>P. ex- celsa</i> , and <i>P. flexilis</i> forbid- den; <i>Ribes</i> not quarantined (121).
1917 March 2	Delaware	State Quarantine	Importation of all white pines and all currants and gooseberries prohibited (121).

Date of Becoming Effective	Promulgating Body	Status	Principal Provisions
1917 March 2	South Carolina	State Quarantine	Importation of all white pines and all currants and gooseberries prohibited (110).
1917 March 6	New York	State Quarantine	Importation of all white pines from New England, Pennsylvania, New Jersey, Ohio, Indiana, Illinois, Minnesota and Wisconsin prohibited; <i>Ribes</i> not quarantined (110).
1917 March 10	Kansas State Entomologists	State Quarantine No. 1. Superseded by Quarantine No. 2 the same year.	Importation of all five-leaved pines and all susceptible forms of <i>Ribes</i> and <i>Grossularia</i> prohibited (121).
1917 March 10	Nevada	State Quarantine	Importation of all pines and all currant and gooseberry bushes from east of the Mississippi River and Minnesota and from all foreign countries prohibited (121).
1917 March 12	Pennsylvania	State Quarantine	Importation of all white pines prohibited; <i>Ribes</i> not quarantined (121).
1917 March 13	Indiana	State Quarantine Amended Aug. 24, 1917	Importation of all white pines and all currants and gooseberries prohibited (121).
1917 March 19	Michigan	State Quarantine	Importation of all five-leaved pines prohibited, of currants and gooseberries only under permit (110).
1917 April 3	South Dakota	State Quarantine	Importation of all white pines and all <i>Ribes</i> and <i>Grossularia</i> from New England, New York, New Jersey, Pennsylvania, Ohio, Wisconsin and Minnesota prohibited (110).
1917 April 3	Maine State Legislature	State Law	Organization of control efforts and establishment of control areas and quarantines authorized (147, 148).
1917 April 3	Maine Forest Commissioner	State Quarantine Amended in 1927 and 1930	Sale, transportation, further planting or possession of all <i>Ribes</i> and <i>Grossularia</i> prohibited; embargo placed on movement into and within the State of any five-leaved pine except under permit (136).

Date of Becoming Effective	Promulgating Body	Status	Principal Provisions
1917 April 11	Maryland	State Quarantine	Importation of all white pines, <i>Ribes</i> and <i>Grossularia</i> from New England, New York, New Jersey, Pennsylvania, Minnesota and Wisconsin prohibited (110).
1917 April 16	New Jersey	State Quarantine	Importation of all white pines from New England, New York, Pennsylvania, Minnesota and Wisconsin prohibited; <i>Ribes</i> not quarantined (121).
1917 April 18	West Virginia	State Quarantine	Importation of all white pines, currants and gooseberries prohibited (121).
1917 April 19	New Hampshire General Court	State Law Amended in 1919 and 1929	State Forester authorized to establish control areas and land-owners required to observe his orders to remove currants, gooseberries and infected pines from the areas (13, 156, 158).
1917 April 19	Rhode Island General Assembly	State Law	State Board of Agriculture authorized to control currant and gooseberry bushes and to remove infected white pines (167, 169).
1917 April 28	New York State Legislature	State Law Amended in 1925, 1926, 1929 and 1930.	<i>Ribes nigrum</i> , <i>R. odoratum</i> and <i>R. aureum</i> outlawed, except undiseased <i>R. nigrum</i> in fruiting currant districts to be established (161).
1917 April 30	Minnesota	State Quarantine No. 1. Amended on July 15, 1917	Importation of all white pines from New England, New York, New Jersey, Pennsylvania, Ohio and Wisconsin prohibited; <i>Ribes</i> not quarantined (121).
1917 May 1	United States Secretary of Agriculture	Federal Quarantine No. 26. Superseded by Federal Quarantine No. 63 in 1926.	All States east of and including Minnesota, Iowa, Missouri, Arkansas and Louisiana quarantined re five-leaved pines, currants and gooseberries, and movement thereof westward out of this area prohibited; movement of five-leaved pines and black currants out of New England and New York prohibited; plants to be used by the U. S. Department of Agriculture for experimental purposes, excepted (37, 85, 110).

Date of Becoming Effective	Promulgating Body	Status	Principal Provisions
1917 May 1	Georgia	State Quarantine	Importation of all white pines, currants and gooseberries prohibited (110).
1917 May 1	Vermont	State Quarantine	Importation of all white pines prohibited; <i>Ribes</i> not quarantined (110).
1917 May 14	Connecticut General Assembly	State Law Amended in 1927	Infected white pines and wild, abandoned or escaped currant and gooseberry bushes to be eradicated (142-146).
1917 May 17	Massachusetts General Court	State Law	Nursery inspector authorized to destroy both infected and uninfected white pines, currants and gooseberries (148a-c).
1917 June 1	United States Secretary of Agriculture	Federal Quarantine Amendment No. 2 to Federal quarantine No. 7 of 1913; revoked in 1936.	Importation into the United States from every country of Europe and Asia of all kinds of currant and gooseberry, except for experimental purposes by the U. S. Department of Agriculture, prohibited (37, 84, 109).
1917 July 3	Montana	State Quarantine Quarantine of 1916 amended	Quarantine imposed on all points east of and including Minnesota, Iowa, Missouri, Arkansas and Louisiana (110).
1917 July 15	Minnesota	State Quarantine Quarantine of April 30 amended.	Quarantine extended to include Michigan (110).
1917 Aug. 17	New York	State Quarantine	Control areas established wherein <i>Ribes</i> could not be grown or shipped (110).
1917 Aug. 24	Indiana	State Quarantine Quarantine of March 13 amended.	Quarantine removed from <i>Ribes</i> and <i>Grossularia</i> (110).
1917 Sept. 21	Maine	State Quarantine Amended in 1927 and 1930	Importation of white pines, currants and gooseberries allowed only under permit (110).
1917 Sept. 25	Illinois	State Quarantine	Importation of all white pines, currant and gooseberry bushes from New England, New York, New Jersey, Pennsylvania, Ohio, Wisconsin and Minnesota prohibited; also from all other sources unless accompanied by a statement declaring the plants propagated and grown in localities not included in these States, Canada, Europe or Asia (110).

Date of Becoming Effective	Promulgating Body	Status	Principal Provisions
1917 Sept. 26	Kansas State Entomological Commission	State Quarantine No. 2. Superseded; quarantine No. 1 of March 10; revoked in 1926.	Prohibition of importation of five-leaved pines, <i>Ribes</i> and <i>Grossularia</i> applied only to States east of and includ- ing Minnesota, Iowa, Mis- souri, Arkansas and Louisi- ana (136).
1917	New Hampshire State Forester	Order Supplemented in 1918 and 1928.	Control areas established in five townships (137).
1918 Feb. 27	New Hampshire State Nursery Inspector	State Quarantine No. 1. Amended in 1921	Movement into New Hamp- shire of any five-leaved pines and susceptible currants and gooseberries, and within the State of all currants and gooseberries prohibited (110, 136).
1918 Sept. 16	Tennessee State Board of Entomology	State Quarantine No. 1. Superseded by State Quar- antine No. 1 (Revised) in 1939.	Shipment into the State of all five-leaved pines and all known susceptible forms of <i>Ribes</i> and <i>Grossularia</i> from east of and including Minne- sota, Iowa, Missouri, Arkan- sas and Louisiana prohibited (137).
1918	New Hampshire State Forester	Order Order of 1917 supplē- mented; further supplemented in 1928.	Control areas established in 30 towns (137).
1919 March 28	New Hampshire General Court	State Law Law of 1917 amended; fur- ther amended in 1929.	Prohibition on entry or movement of <i>Ribes</i> extended to the "products thereof" (156, 157, 159).
1919 April 3	Nebraska State Legislature	State Law	Referred specifically to bar- berry but also to "any plant which acts as host of a dan- gerous plant disease" and so could be applied to currants, gooseberries and white pines (154).
1919 April 8	Rhode Island State Department of Agriculture	Rule and Regulation Superseded in 1928	Planting of white pines, gooseberries or currants only under permit; no such plant- ing at all in towns of Coven- try and West Greenwich; planting of black and flower- ing currants within the State prohibited (110).
1921 April 9	New Hampshire State Nursery Inspector	State Quarantine Quarantine No. 1 of 1918 revised.	Quarantine modified by admitting five-leaved pines under certain conditions (136).

Date of Becoming Effective	Promulgating Body	Status	Principal Provisions
1921 Sept. 17	Washington Director of Agriculture	State Quarantine No. 2.	Movement into the State of any five-leaved pine or any currant or gooseberry plants from east of North Dakota, South Dakota, Nebraska, Oklahoma and Texas prohibited (136).
1922 March 1	Washington Director of Agriculture	State Quarantine No. 7. Amended same year; re- voked in 1927.	Movement of all five-leaved pines, currants and gooseberries eastward across the Cascade Mts. prohibited; all black currants in 10 specified counties ordered destroyed (78).
1922 March 15	United States Secretary of Agriculture	Federal Quarantine No. 54. Amended in same year; superseded by Federal Quar- antine No. 63 in 1926.	Interstate movement of 15 species of five-leaved pine and of all currant and gooseberry bushes out of the State of Washington, prohibited, except under certain conditions (15, 29, 53, 57).
1922 Sept. 1	Washington Director of Agriculture	State Quarantine Order No. 12. Amended State Quarantine No. 7 of 1922; revoked in 1927.	Intrastate movement of all currants (except <i>Ribes nigrum</i>) and gooseberries from licensed and inspected nurseries permitted (133, 60a).
1923 Feb. 14	Oregon Legislative Assembly	State Law Amended in 1929	Growing, propagating or distributing <i>Ribes nigrum</i> or <i>Berberis vulgaris</i> , declared unlawful, subject to \$100 fine (52, 163, 164).
1923 March 2	United States Secretary of Agriculture	Federal Quarantine Amendment No. 1 to Fed- eral Quarantine No. 54 of 1922; superseded by Federal Quarantine No. 63 in 1926.	Quarantine extended to the entire State of Washington. (5, 11, 60a, 133).
1925 April 2	New York State Legislature	State Law Law of 1917 amended; fur- ther amended in 1926, 1929 and 1930.	Exemption of undiseased <i>Ribes nigrum</i> in fruiting currant districts, cancelled (161).
1926 Jan. 16	New Mexico Regents of the Agri- cultural College	State Quarantine Order No. 7	Introduction of five-needle pines, currants and gooseberries from Washington and Oregon and all States east of and including Minnesota, Iowa, Missouri, Arkansas and Louisiana, and from any other State in which blister rust may be found, forbidden (136).

Date of Becoming Effective	Promulgating Body	Status	Principal Provisions
1926 March 4	New York State Legislature	State Law Law of 1917, amended in 1925, further amended; again amended in 1929 and 1930.	Landowners required to re- move currant and gooseberry bushes from within 900 feet of protected white pines on land of adjoining owners; compensation to owners for plants destroyed limited to trees and cultivated <i>Ribes</i> and <i>Grossularia</i> in lieu of plants in general (161).
1926 Oct. 1	United States Secretary of Agriculture	Federal Quarantine No. 63 Superseded Federal Quar- antines Nos. 26 of 1917 and 54 of 1922.	Entire United States quar- antined re five-leaved pines, currants and gooseberries, all interstate movement thereof, except under certain condi- tions, being prohibited (24, 113).
1926 Oct. 29	Montana Governor	State Quarantine No. 3-A	Destruction of all <i>Ribes</i> <i>nigrum</i> within the State or- dered and possession, prop- agation or sale of them declared unlawful; also movement of them into or within the State prohibited (136).
1926 Dec. 9	Kansas Entomological Commission	Revocation of State Quarantines Nos. 1 and 2 of 1917	Revoked and superseded by Federal Quarantine No. 63 (19).
1927 Feb. 7	New Jersey	State Quarantine	Quarantine of 1917 re- pealed because its purpose was accomplished by Federal Quarantine No. 63 (108).
1927 May 5	Connecticut General Assembly	State Law Law of 1917 amended	Director's authority to re- move currant and gooseberry bushes extended to cultivated plants (142, 145).
1927 July 29	California State Legislature	State Law Superseded in 1933	Growing, propagating and distributing <i>P. nigrum</i> de- clared unlawful (138).
1927 July 29	California State Legislature	State Law	<i>Ribes nigrum</i> added to offi- cial list of noxious weeds (138a, b).
1927 Aug. 4	Idaho Commissioner of Agriculture	State Quarantine Order No. 9	Destruction of all <i>Ribes</i> <i>nigrum</i> and its varieties or- dered, possession, propaga- tion or sale thereof declared unlawful and importation and movement thereof prohibited (136).
1927 Aug. 4	Idaho Commissioner of Agriculture	State Quarantine Order No. 10	Part of the State desig- nated as a control area and all currant and gooseberry bushes therein outlawed (136).

Date of Becoming Effective	Promulgating Body	Status	Principal Provisions
1927	Wisconsin State Department of Agriculture and Markets	Plant Quarantine and Inspection Regulations —Order No. 1f	No inspection certificate covering sale or shipment of any form of <i>Ribes nigrum</i> to be issued, and no package or dormant season inspection of currant or gooseberry bushes or white pines to be made (136).
1927	Wisconsin State Department of Agriculture and Markets	Plant Quarantine and Inspection Regulations —Order No. 3	Federal quarantine No. 63 together with its amendments designated, along with others, as necessary to prevent introduction of dangerous plant diseases or insect infestations into the State, and any material introduced in violation thereof declared subject to destruction or return (136).
1927	Washington	Revocation of State Quarantine No. 7 of 1922, amended same year.	Revoked because its purpose was served by Federal Quarantine No. 63 of 1926 (137).
1927 Dec. 24	Maine Forest Commissioner	State Quarantine State Quarantine of 1917 revised; further revised in 1930.	Quarantine made applicable only to certain towns and counties (136).
1928 April 1	Rhode Island Commissioner of Agriculture	Blister Rust Rule and Regulation. Superseded Rule and Regu- lation of 1919; amended in 1936.	Planting, transportation and importation of <i>Ribes</i> and five-leaved pines only under permit; <i>R. nigrum</i> completely outlawed and destruction thereof by Commissioner authorized; planting of <i>R. aureum</i> and <i>R. odoratum</i> prohibited; control areas established; \$100 fine (136).
1928 Oct. 4	Virginia State Board of Agriculture	Regulation	Blister rust placed under the Crop Pest Law and authority given to promulgate quarantine regulations (136).
1928 Oct.	Connecticut	State Quarantine Order No. 17.	Blister rust control areas established (136).
1928	New Hampshire State Forester	Order Order of 1917, supple- mented in 1918, further sup- plemented.	Entire State south of certain northern towns declared a control area (136).
1929 March 16	New York State Legislature	State Law Law of 1917, amended in 1925 and 1926, further amended; again amended in 1930.	Compensation for destruction of diseased currants and gooseberries cancelled, owners made liable to charges for destroying their bushes (161).

Date of Becoming Effective	Promulgating Body	Status	Principal Provisions
1929 April 17	Minnesota State Legislature	State Law	Black currants outlawed; establishment of control areas authorized; authorities empowered to remove pines and <i>Ribes</i> ; compensation given for destruction of uninfected plants (151, 152).
1929 May 24	Michigan State Legislature	State Law	Commissioner of Agriculture authorized to destroy any pines, currants and gooseberries and to establish control areas; black currants completely outlawed (149, 150).
1929 June 3	Connecticut General Assembly	State Law	<i>Ribes nigrum</i> completely outlawed (142, 146).
1929	New Hampshire State Legislature	State Law Law of 1917, amended in 1919, further amended.	Towns made liable to \$400 annually for eradication work on public lands (160).
1930 Feb. 17	New York State Legislature	State Law Law of 1917, amended in 1925, 1926 and 1929, further amended.	<i>Ribes odoratum</i> and <i>R. aureum</i> no longer outlawed (161).
1930 Feb. 27	Massachusetts State Department of Agriculture	Regulation Amended in 1941	Transportation, sale and planting of currant and gooseberry bushes in specified towns, prohibited (136).
1930 March 25	Maine Forest Commissioner	State Quarantine Quarantine of 1917, revised in 1927, further revised.	Quarantine extended to additional parts of the State (136).
1933 April 24	Pennsylvania General Assembly	State Law	Black currants outlawed; establishment authorized of control areas for protection of either white pines or currants and gooseberries (165, 166).
1933 Aug. 21	California State Legislature	State Law Law of 1927 superseded	Almost identical provision in new Agriculture Code replaced law of 1927 (139-141).
1933 Dec. 1	Minnesota Department of Agriculture, Dairy and Food	Regulation Amended in 1934 and 1935	Control areas established and shipment of currant and gooseberry plants into them allowed only under permit (136).
1934 Feb. 1	West Virginia Commissioner of Agriculture	State Quarantine Order No. 5 Amended in 1934	Control areas established around a particular nursery (136).

Date of Becoming Effective	Promulgating Body	Status	Principal Provisions
1934 May 25	Virginia Commissioner and State Board of Agriculture and Immi- gration	State Quarantine No. 3 Revised in 1938	Dissemination, growing or other uses of currants and gooseberries in the western part of the State prohibited, and movement of five-leaved pines therein permitted only under permit (136).
1934 June 15	West Virginia Commissioner of Agriculture	State Quarantine Order Order No. 5 of 1934 amended.	Quarantine extended to a second nursery (136).
1934 July 25	North Carolina State Board of Agriculture	State Quarantine No. 2.	Commissioner of Agricul- ture authorized to establish control areas and to destroy all wild and cultivated cur- rants and gooseberries there- in. Transportation into and planting within such areas of those plants, except under permit, prohibited (136).
1934 Dec. 1	Minnesota Commissioner of Conservation	Order No. 1 Amended in 1936 and 1937	Control areas established wherein currants and goose- berries may be planted only under permit (136).
1935 Jan. 23	North Carolina Commissioner of Agriculture	Order	Control area established (136).
1935 Feb. 23	Minnesota State Entomologist and Inspector of Nurseries	Regulation	Control areas contiguous to two nurseries established (136).
1935 March	Rhode Island Director of Agri- culture and Conservation	Rule and Regulation. Amended in 1936	[Copy of the original was not available either in blister rust eradication literature or from State officials.]
1935 Aug. 1	Ohio Director, Ohio De- partment of Agriculture	Regulation No. 9 Supplemented Oct. 15	Control areas surrounding all five-leaved pine nurseries warranting such treatment proclaimed (136).
1935 Oct. 15	Ohio Director of Agriculture	Regulation No. 9	Movement of five-leaved pines only by permit under certain conditions; <i>Ribes nig- rum</i> outlawed; control areas established (136).
1935 Dec. 1	Maryland State Board of Agriculture	Rule and Regulation	Control areas established and introduction of currant and gooseberry bushes there- in prohibited (136).
1936 Jan. 15	Pennsylvania Department of Forests and Waters		Two control areas estab- lished, destruction of currant and gooseberry plants therein ordered and growing of <i>Ribes nigrum</i> within a mile of one of the areas forbidden (136).

Date of Becoming Effective	Promulgating Body	Status	Principal Provisions
1936 May 5	Wisconsin State Department of Agriculture and Markets	General Order No. 3E	All <i>Ribes nigrum</i> ordered eradicated with no compen- sation to owners (136).
1936 June 9	Minnesota Commissioner of Conservation	Order No. 2 Order No. 1 of 1934 amended; further amended in 1937.	Blister-rust control area extended (126).
1936 Sept. 1	United States Secretary of Agriculture	Revocation of Federal Quarantine No. 7 and its two amendments.	Revoked because its pur- pose was accomplished by Federal Quarantines Nos. 37 and 63 (20, 82, 124).
1936 Oct. 1	Rhode Island State Department of Agriculture	Rule and Regulation Rule and regulation of 1928 amended.	<i>Ribes aureum</i> and <i>R. odo- ratum</i> freed from restric- tions; destruction of <i>R. nig- rum</i> to carry no compensa- tion to owners (136).
1937 Jan. 1	Wisconsin State Department of Agriculture and Markets	General Order No. 3E	Control areas established, planting of currants and gooseberries therein pro- hibited and those already present therein ordered de- stroyed or removed without compensation (136).
1937 April 21	Pennsylvania General Assembly	State Law	The "Pennsylvania Plant Pest Act", controlling plant pests in general and specifi- cally providing compensation for destruction of <i>Ribes</i> (166a).
1937 Nov. 29	Minnesota Director, Division of Forestry and Com- missioner of Conservation	Order No. 3 Order No. 1 of 1934, amended in 1936, further amended.	Control areas further ex- tended (136).
1937	Minnesota State Entomologist Commissioner of Agriculture and Attorney General	Regulation	Movement into or within control areas of <i>Ribes</i> and <i>Grossularia</i> plants, roots, cuttings or scions, except un- der permit, prohibited (136).
1938 July	Virginia	State Quarantine No. 3 (Revised)	
1938 July 29	California Director of Agriculture	State Quarantine Regulation No. 3	Many control areas estab- lished; movement of any cur- rant and gooseberry bushes in the control areas and of <i>Ribes nigrum</i> , <i>R. bracteosum</i> and <i>R. petiolare</i> (plants, cut- tings or seeds), anywhere within the State, prohibited; movement of five-leaved pines out of designated in- fected areas only under per- mit (136).

Date of Becoming Effective	Promulgating Body	Status	Principal Provisions
1938 Sept. 15	New York Conservation Commissioner	Order	Control areas established, importation thereinto or planting, possession and propagation therein of any currants and gooseberries prohibited (67a).
1938 Dec. 21	New Jersey State Board of Agriculture	Order	Control areas established (136).
1939 Feb. 2	Oregon Legislative Assembly	State Law Law of 1923 amended	Minor change (163).
1939 March	Central Plant Board	Recommendation	Recommended that movement of white pines between infected States be permitted only from nurseries surrounded by 1500-foot <i>Ribes</i> -free and one mile <i>Ribes nigrum</i> -free zones (21a); adapted by all the States of the Board. ²¹
1939 June 1	Illinois Director of Agriculture	Blister Rust Regulations	Control areas to exist around any white pines present in sufficient amounts to justify protection (137, 138).
1939 Dec. 13	Tennessee Department of Agriculture	State Quarantine No. 1 (Revised) Superseded Quarantine No. 1 of 1918; revised in 1941.	Establishment of control areas and eradication of all wild and cultivated currant and gooseberry bushes therein by the authorities authorized; planting or transporting such bushes in the area allowed only under permit; pines subject to destruction when infected or when less valuable than neighboring currant and gooseberry bushes (136).
1940 April 26	United States Congress	Federal Act	Provisions made for preventing spread of the rust to and eliminating it from all forest lands, irrespective of their ownership (171).
1941 March 5	Massachusetts State Department of Agriculture	Regulation Order of 1930 amended	Transportation, sale and planting of currant and gooseberry bushes in 203 towns prohibited (136).
1941 June	Tennessee	State Quarantine Quarantine No. 1 of 1939 revised.	Minor change in recognition of Federal Quarantine No. 63 (65).

²¹ According to a communication from E. L. Chambers, State Entomologist of Wisconsin.

*Species and Varieties of Pinus, Ribes and Grossularia Affected
by Legislation*

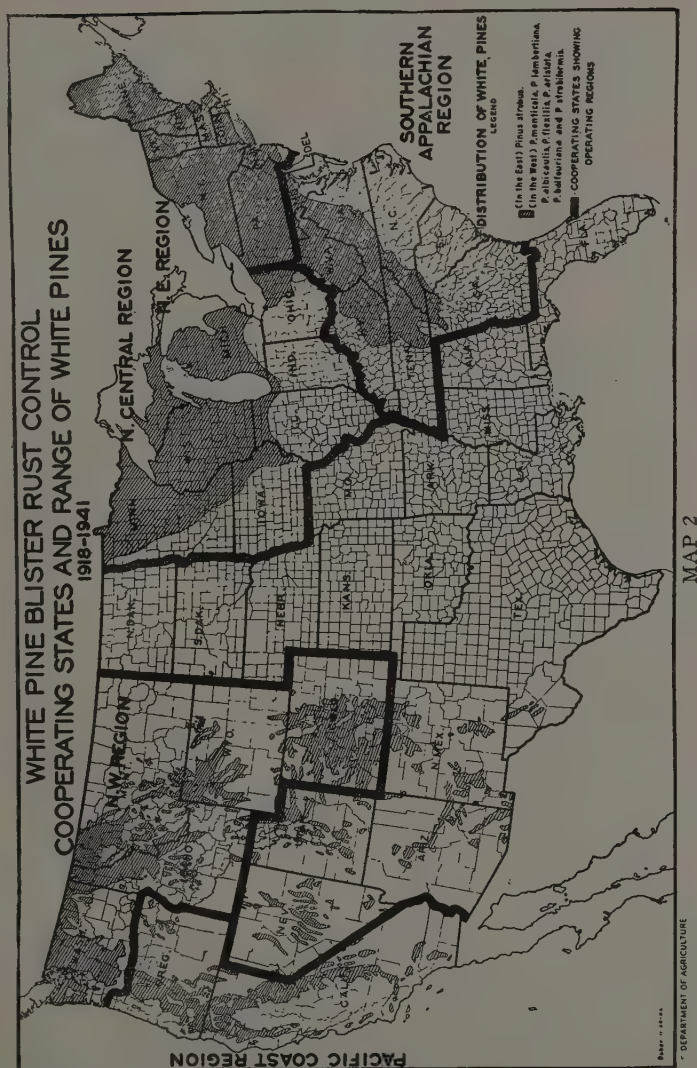
All five-leaved forms of pine, without exception, are included in any restrictions, so far as they apply to that genus. The species concerned are (40) :

NATIVE TO U. S.	FOREIGN
<i>Pinus aristata</i>	<i>Pinus Armandi</i>
<i>Balfouriana</i>	<i>Ayacahuite</i>
<i>flexilis</i>	<i>Cembra</i>
<i>Lambertiana</i>	<i>excelsa</i>
<i>monticola</i>	<i>koraiensis</i>
<i>albicaulis</i>	<i>parviflora</i>
<i>Strobus</i>	<i>Peuce</i>
<i>strobiformis</i>	

Currants and gooseberries constitute two so similar and closely related groups that while sometimes regarded as falling into two generic categories, *Ribes* and *Grossularia*, respectively, at other times they are considered under one generic heading, *Ribes*. So constituted, the genus *Ribes* comprises about 150 species, many of which with numerous hybrids and varieties have been introduced into cultivation in the United States. The European red currant, *R. vulgare*, and the European black currant, *R. nigrum*, are the two principal sources of the many varieties also in cultivation. *Ribes nigrum* and its varieties are the principal offenders in disseminating blister rust and are therefore specifically referred to in many legislative decrees and their extermination ordered. In Federal Quarantine No. 63 and the California State quarantine the two native western species, *R. bracteosum* and *R. petiolare*, are also specifically mentioned, in addition to black currant, for they are on a par with *R. nigrum* in susceptibility to the rust.

Beneficial Results of Legislation

It suffices for our purpose under this heading to note that as a result of Federal, State and private cooperative efforts, 1,116,127,-056 currant and gooseberry bushes were destroyed in *Ribes* eradication work from 1918 through 1941 in the area indicated on the accompanying map, which is printed here by permission of the U. S. Bureau of Entomology and Plant Quarantine. The work has been performed under the State laws, quarantines and other regulations described on the foregoing pages, which have provided the legal authority for carrying out the control activities. These activities,



MAP 2

on a large scale, began in the Northeast in 1922, in the Northern Rocky Mountain Region in 1931, in the North-Central Region in 1932, and in the Southern Appalachian and Pacific Coast Regions in 1933. Much has been accomplished, but much still remains to be done, and only eternal vigilance will protect America's stands of white pine from the fate of the American chestnut. How fortunate that the blister rust is a heteroecious rust which can be controlled by eradicating its alternate hosts.

LITIGATION

Two hundred or more violations of the Federal blister-rust quarantine are on record (1, 9, 32-34, 38, 44-46, 55, 94), wherein the defendants have pleaded guilty and paid fines. These instances have involved, of course, interstate movement of white pines, currants or gooseberries, for it is only in such traffic between States that any Federal jurisdiction prevails. None of these cases, so far as the author knows, has been appealed. Neither has there been any appeal with regard to convictions in violations of State ordinances, though it is safe to assume that many such infringements of the law have occurred. One of them, at least, has come to the author's attention (170). It was adjudicated in 1937 in a district court of Minnesota without resort to a higher tribunal. The circumstances were as follows:

According to the white-pine blister-rust law of Minnesota, enacted in 1929, the Commissioner of Forestry and Fire Prevention of that State is authorized to designate blister-rust control areas within the State. Under this authority, the Commissioner, previous to the action involved in this case, established five such control areas within the city of Duluth. One of these areas included a certain section known as Congdon Park which harbored about 10,000 standing white pines.

The law stipulated, further, that—

Any white-pines or currants or gooseberries within the state which are found to be infected with white-pine blister-rust are hereby declared a public menace, and any such diseased plants may be destroyed forthwith by order of the Commissioner or his agents. Any currants, gooseberries or white-pines not infected with white-pine blister-rust may be destroyed by the Commissioner or his agents where necessary for carrying out the purposes of this act.

In accordance with this provision, all cultivated currant and gooseberry bushes were removed by the authorities from four of the con-

trol areas and from 185 gardens in the vicinity of Congdon Park, the owners consenting to such removal. One owner, however, when properly notified that eight cultivated currant bushes on his property should be removed, objected and secured a temporary injunction restraining the authorities from entering upon his property and removing the bushes. His objection was founded, in part, on the contentions that

- a) The bushes were not infected with white-pine blister-rust.
- b) The officials had no authority whatsoever under the mentioned law to enter upon his premises and destroy the plants.
- c) The law referred only to the "European English or cultivated black currant" whereas his plants were of the red and white harmless varieties, not susceptible to spread of the rust.
- d) His bushes were not within 900 feet of the pines, the dangerous distance recognized by the law.
- e) He had offered to let the officials remove the bushes provided he be paid a reasonable value for them, but that the officials insisted the bushes be removed without compensation to him.

In support of these contentions the plaintiff produced affidavits from several persons to the effect that the bushes were not infected, that his property was approximately 1420 feet from Congdon State Park, and that some of the affiants had had cultivated black currants removed from their lands but that their red currant bushes had not been touched.

The Conservation Commissioner of the State was the principal defendant in the action, and it was his responsibility to show good reason why the plaintiff's plea for a permanent injunction restraining the officials should not be granted. To this end he introduced five affidavits, some rather lengthy, indicating that the bushes under discussion were definitely infected. These affidavits, by persons obviously well qualified to testify, described in considerable detail the work of blister-rust control in the State and the biology of the causal pathogen.

In considering the evidence presented by both the plaintiff barberry bush owner and the defendant Commissioner, and in order to render judgment upon the plaintiff's petition for a permanent injunction against the Commissioner, the court referred to the part of the law quoted here on the preceding page and then continued:

From a reading of the act all kinds of currant bushes and gooseberries are involved.

This section declares all white-pines or currants or gooseberries within the state which are found to be infected with white-pine blister-rust a public menace and authorizes their destruction. It also authorizes the destruction by the commissioner or his agents of currant and gooseberry bushes although not infected where necessary for the carrying out of the purposes of the act. The plaintiff claims his eight currant bushes are not infected. Under the act, it is immaterial if they are infected or not if found within a designated blister-rust control area. Upon the reading of the supporting affidavits in this case, one cannot escape the conclusion that the plaintiff's bushes are, in fact, infected.

Plaintiff insists there must be some remedy to the property owner under circumstances such as this. If his bushes are infected, the law declares them a menace and he has no remedy. If they are not infected, the law provides that the property owner may be compensated to the extent of their actual value.

It seems agreed by all authorities that it is practicable to halt the spread of the disease known as white pine blister-rust by destroying currant and gooseberry bushes within a certain distance from white pine-trees. That distance is estimated at from 900 to 1500 feet. There are 392 white-pine trees within the infection area of plaintiff's bushes. The value of the bushes is very small compared with the value of the 392 white-pine trees which they may destroy. At the hearing of this matter it was stated that there are 10,000 trees in Congdon Park and plaintiff's bushes are but a short distance from said park.

Reference is then made in the court record to the earlier United States Supreme Court decision in connection with apple rust, as cited on pages 562-566 of this paper. Returning to the case in hand, we read:

The standing white-pine in this area,—10,000 in Congdon Park alone,—certainly are of greater value to the public than eight currant bushes and the remaining currant and gooseberry bushes found in the other seven gardens in this area. As was held in the United States Supreme Court case already cited, When forced to make the choice, the state does not exceed its constitutional powers by deciding upon the destruction of one class of property in order to save another which in the judgment of the legislature, is of greater value to the public.

As a result of the foregoing considerations, the plaintiff's petition for a permanent injunction was denied and his bushes presumably removed.

III. CEDAR

INTRODUCTION

The cultivated apple was introduced into America from Europe along with colonization of the New World, and by the beginning of the twentieth century was so well established in the East, the Central States and the Pacific Northwest that the United States has since become the foremost apple-producing country of the world.

For nearly 300 years this industry developed without serious interference by the disease which now holds our attention and which was demonstrated between 1886 and 1888 to be caused by a heteroecious fungus with the common red cedar, *Juniperus virginiana*, as its alternate host (14).²² This fungus, *Gymnosporangium juniperi-virginianae*, had previously found a suitable host in the native American crab apple, but for the greater part of the period mentioned did not seriously affect the introduced apples. Beginning in 1905, however, and continuing in subsequent years, the disease attracted growing attention as it gradually spread to certain varieties of cultivated apple; and in 1912 it destroyed the entire fruit crop in many blocks of trees in Virginia and adjacent States.

Before all this development and only a few years after the heteroecious nature of the causative pathogen had been announced, it was suggested that the rust on apples might be controlled by removing adjacent cedars. Magical results had been achieved by establishing a cedar-free zone for a radius of one mile around an orchard that had suffered severely (9a). The recommendation may have been followed, but not so as to attract much notice until a few enterprising orchardists in the neighborhood of Winchester, Virginia, probably not acquainted with that early experiment but at least cognizant of the rôle played by local junipers in dissemination of the disease, cut down the red cedars around their orchards. There were such striking results and demonstration of the efficacy of this method of control that before long several State agricultural experiment stations and the United States Department of Agriculture were recommending the procedure as a means of controlling the disease (14). The idea gradually spread among apple orchardists but they soon found their voluntary eradication efforts frustrated by owners of cedar trees who thought more of their junipers than of the apple growers' problems. So once more the law was called into play.

LEGISLATION

State Laws. It was in Virginia, in the famous Shenandoah Valley of that State, that the interests of apple orchardists was great enough to secure the first legislative measures in America against red cedar. Here, too, in contrast to barberry and currants, the value attached to the condemned alternate hosts was sufficient to

²² Cedar citations are on pages 589-591 of the bibliographies.

contest these measures, as we shall later note, to a degree which involved considerable litigation and rather bitter local animosity.

The law (32, 37-42), enacted in 1914 and later undergoing four amendments, began by generally outlawing "any red cedar tree or trees (which are or may be) the source, harbor or host plant for the communicable plant disease commonly known as 'orange' or 'cedar rust' of the apple". It then ordered owners of any such trees growing within one mile of any apple orchard in the State to destroy them when directed to do so by the State Entomologist. The latter official is ordered to give such notice on the basis of inspections made in response to requests in writing to do so by "ten or more reputable freeholders of any county or magisterial district".

In connection with this provision, the law, as originally published, contained a conflict which, as we shall also note later, provoked considerable discussion in court. The first paragraph of the law, as already stated, referred to cedar trees within one mile of apple orchards; the second paragraph, in two places, instructed the Entomologist to give notice for removal when he found infected trees within two miles. Such contradiction with respect to the dangerous distance between apple and cedar trees would very naturally be disturbing to those entrusted with enforcement. It was not until six years later, in 1920, however, that the ambiguity was definitely removed by an amendment of the first paragraph which established the distance at two miles (33, 39-42).

During the intervening and later years it became more and more apparent that two miles was too short a distance for protection of apples from rust spores blown from cedar trees. In 1936, accordingly, the distance was extended to three miles (36, 42).

To return to other provisions in the original law, still in effect, the State Entomologist is given the alternative of directing owners of cedar trees to treat them in such a manner as to render them harmless. This provision was made in order to avoid destroying ornamental trees in dooryards, graveyards, cemeteries and parks, and owners not abiding by instructions for treatment are subject to fines of from \$5 to \$50. Similar fines are imposed for hindering the authorities in removing trees which the owners refuse to destroy, and the counties are to be reimbursed for expenses incurred in such removals by levies not exceeding one dollar per acre imposed on apple orchardists. Certain details of this feature were changed in

1922 (34, 39-42). The benefited apple growers are thus required to finance removal of cedar trees from other people's land, and it is unlikely that the latter under these conditions would ever do so themselves.

The owners of condemned trees, too, are given some privileges in the law; they have the right to appeal from orders of the Entomologist to the county circuit court and may be reimbursed for expenses incurred in removing their trees. By an amendment in 1924, obviously in response to a type of situation previously unforeseen, the Entomologist is authorized to enter upon land from which cedars have previously been removed, and destroy any subsequently appearing sprouts (35, 40-42).

The final provision in the law is to be particularly noted, for it was the premise upon which much court discussion later ensued. It provided that the act would not be in force in any county until approved by the local board of supervisors or by public petition, and this approval then ratified by the circuit court.

New York, in 1923, was the second State to enact a cedar law (26, 30, 31), but it remained on the books only four years. In 1927 it was repealed and replaced by more general provisions for control of plant diseases, without specific reference to either the disease itself or to the hosts of the causative pathogen (28, 29). The law, as originally enacted, provided, first, for establishment of so-called "fruiting apple districts" and directed that all its other provisions be applied to these districts. The latter were to be areas wherein apple production was carried on as an important commercial enterprise and wherein cedars would be outlawed. Such areas were defined in 1923 in three districts in the Hudson Valley, mainly in Columbia and Ulster Counties.²³ Provision was also made for establishment of quarantines against the trees anywhere in the State. Compensation was to be made to owners for trees destroyed by the authorities, and, finally, \$25,000 was appropriated for enforcing the law and for paying these compensations.

In 1925 West Virginia entered the battle against apple rust with its law (43-45). Anticipating the third amendment to the Virginia statute, it declared as unlawful the keeping alive and standing upon one's premises of any cedar tree within three miles of an apple

²³ According to a communication from A. B. Buchholz, Director of the New York State Plant Industry Bureau.

orchard. Owners of such trees must destroy them within 60 days of receiving notice from the Commissioner, and the latter is directed to make investigations and send such notices upon receiving written requests from ten or more reputable freeholders. The apple growers are thus provided, as in the Virginia law, with a means of starting action. As in the other State, too, the alternative of treating rather than destroying trees, when regarded as efficacious, is provided for, and provision is made for charging the owner for such treatment in the event he does not give it himself upon the recommendation and under the supervision of the Commissioner. The latter, of course, is authorized to destroy privately owned trees, and compensation to aggrieved owners is also cared for. As in the Virginia law, the benefited orchardists are called upon to meet the expenses of paying these damages or costs of destruction when such payments are made out of general county funds. This is done by county levies not exceeding \$1 per acre on all apple orchards in the respective counties.

In 1929 the idea of controlling apple rust by fiat had gained such advocacy in the Mid-west that Nebraska adopted a State law directed against the disease (17, 19-23). As in the other States, cedar trees were to be destroyed, but the formulators of this statute saw fit to limit the debatable distance to two miles. They made the further stipulation that an orchard must contain 1000 or more apple trees before cedar trees near it must be cut down. The State Department of Agriculture is to make investigations and issue instructions upon the solicitations of "five or more reputable free-holders of any county or district", but by an amendment of 1931 this may now be secured by the request of only one or more persons (18, 20-23). By this amendment the land owners are also required to remove sprouts which may develop after trees have been cut. The alternative of treating infested trees is also recognized.

A provision in the original law, which was most drastically changed in 1931 (18) along with the other amendments, gave directions for paying damages to owners of trees removed, and then reimbursing the counties for such payments by taxing orchardists not over \$1.50 per acre. Virginia and West Virginia, we have already observed, have similar provisions, but Nebraska saw fit not only to discontinue compensation, but, as if to add insult to injury, to charge the tree owners for removing their trees when they do not do so themselves. And if the owners hinder removal of the

trees, they become subject to fines of not less than \$50 but as high as \$200.

In 1919, ten years before this special cedar rust ruling, Nebraska enacted a law, already referred to in connection with barberry and currants, which gave the authorities control over "any plant which acts as a host of a dangerous plant disease" (16).

The Nursery Inspection Act of New Mexico, adopted in 1937, makes it unlawful to bring red cedars into the State, subject to a \$25 to \$100 fine (24, 25).

State Quarantines. In 1932 the Entomological Commission of Kansas issued a quarantine by which cedar eradication areas were established and sale, gift, distribution or planting of red cedars within them prohibited (3).

Departmental Orders. In 1919 the State Plant Board of Arkansas issued a public notice and two rules regarding cedar rust. One of the latter established eradication areas and declared red cedar and cedar rust (caused by *Gymnosporangium juniperi-virginianae*, *G. globosum* and *G. germinale*) in them to be public nuisances. The other rule prohibited maintenance of infected red cedar trees within one and one-half miles of apple orchards in the eradication areas.

In 1936 the Central Plant Board recommended that there be no movement of infected cedars out of nurseries in the named States and that all cedar apples on cedar trees in nurseries be removed (13). This recommendation was adopted by all the States involved at the time of its formulation.²⁴

In 1940 the State Secretary of Agriculture in Pennsylvania promulgated rules and regulations for control of the disease in that State. By them the owners or managers of apple orchards may appeal to the State Bureau of Plant Industry for removal of cedars surrounding their orchards. Owners of the trees within one mile (more or less according to the judgment of the inspector) of the orchards may then be ordered to remove the trees. Compensation ranging from \$.16 to \$.75 per plant removed are to be paid to owners, except to those owning orchards protected by virtue of such removal (15).

Summary. Since 1914, when Virginia adopted the first legal step toward control of cedar rust, seven States in all have attempted to protect their apple orchards by legislating against the cedar hosts, five of them by State laws and the others in other ways.

²⁴ According to a communication from E. L. Chambers, State Entomologist of Wisconsin.

CHRONOLOGICAL SUMMARY OF STATE AND DEPARTMENTAL LEGISLATION AND REGULATION RESPECTING QUARANTINE AND CONTROL OF RED CEDAR TREES

Date of Becoming Effective	Promulgating Body	Status	Principal Provisions
1914 March 4	Virginia General Assembly	State Law Amended in 1920, 1922, 1924 and 1936.	Owners of cedar trees ordered to destroy them when within one mile of apple trees; State Entomologist to enforce law when cedars are within two miles of apple trees; discrepancy corrected by amendment of 1920 (31, 37-42).
1919 April 3	Nebraska State Legislature	State Law	Refers specifically to barberry but also to "any plant which acts as a host of a dangerous plant disease" (15).
1919 Nov. 22	Arkansas State Plant Board	Public Notice Superseded in 1920	Cedar rust control areas established. ²⁵
1919 Nov. 22	Arkansas State Plant Board	Rule 2, Sec. B.	<i>Gymnosporangium juniperi-virginianae</i> , <i>G. globosum</i> , <i>G. germinale</i> and red cedar declared nuisances in control areas (15).
1919 Nov. 22	Arkansas State Plant Board	Rule 51	Maintenance of infected red cedars within 1½ miles of apple orchards in control areas, prohibited (15).
1920 Feb. 27	Arkansas State Plant Board	Public Notice Notice of 1919 superseded; amended in 1922.	Territory covered by notice of 1919 extended (21).
1920 March 16	Virginia General Assembly	State Law Law of 1914 amended; further amended in 1922, 1924 and 1936.	Discrepancy in original law corrected by making regulations applicable to trees within two miles of apple orchards (33, 39-42).
1922 March 10	Virginia State Legislature	State Law Law of 1914, amended in 1920, further amended; amended again in 1924 and 1936.	Concerned details of levy on orchardists (34).
1922 June 10	Arkansas State Plant Board	Public Notice Notice of 1920 amended	Eradication area further changed (15).
1923 May 29	New York State Legislature	State Law Amended in 1925 and 1927; repealed in 1927.	Establishment of commercial fruiting apple districts authorized and red cedars within them outlawed (26).

²⁵ According to a communication from P. H. Millar, Chief Inspector of the Arkansas State Plant Board.

Date of Becoming Effective	Promulgating Body	Status	Principal Provisions
1923	New York		Fruiting apple districts established. ²³
1924 Feb. 26	Virginia State Legislature	State Law Law of 1914, amended in 1920 and 1922, further amended; amended again in 1936.	State Entomologist authorized to reenter upon land and remove cedar sprouts arising after an initial removal of the trees (34).
1925 April 2	New York State Legislature	State Law Law of 1923 amended; further amended in 1927; repealed in 1927.	Minor detail (27).
1925 July 22	West Virginia State Legislature	State Law	Cedar trees within three miles of apple orchards ordered destroyed (43).
1927 March 19	New York State Legislature	State Law Law of 1923, amended in 1925, further amended; repealed in 1927.	Minor detail (28).
1927 March 21	New York State Legislature	State Law	Law of 1923, amended in 1925 and 1927, repealed and superseded by a more general law (29).
1929 April 29	Nebraska State Legislature	State Law Amended in 1931	Cedar trees within two miles of orchards of 1000 or more apple trees, ordered destroyed; compensation provided (17).
1931 March 28	Nebraska State Legislature	State Law Law of 1929 amended	Compensation discontinued and tree owners charged for removing their trees (18).
1932 Dec. 7	Kansas Kansas Entomological Commission	State Quarantine No. 6 Amended in 1933	Eradication areas established, and sale, gift, distribution or planting of red cedars therein prohibited (3).
1933 April 10	Kansas Kansas Entomological Commission	State Quarantine Quarantine of 1932 amended	Eradication area changed (3).
1936 Feb. 17	Virginia State Legislature	State Law Law of 1914, amended in 1920, 1922 and 1924, further amended.	Distance extended to three miles (36, 42).
1936 March 4	Central Plant Board	Recommendation	Movement of infected cedars out of nurseries to be prohibited; removal of all cedar apples in nurseries to be ordered (13); adopted by all the States of the Central Plant Board. ²⁴

Date of Becoming Effective	Promulgating Body	Status	Principal Provisions
1937 April 21	Pennsylvania General Assembly	State Law	The "Pennsylvania Plant Pest Act", controlling plant pests in general and specifically providing compensation for destruction of red cedars (31a).
1937 March 15	New Mexico State Legislature	State Law	State Nursery Inspection Act made it unlawful to introduce red cedar, subject to \$25-100 fine (24, 25).
1940 April 15	Pennsylvania Secretary of Agriculture	Regulation	Provisions made to remove cedars when necessary within one mile of apple orchards and to compensate cedar owners therefor, except those also owning apple trees protected by such removal (15).

LITIGATION

Considerable opposition has met the attempts of State officials, especially in the apple-growing districts of the famous Shenandoah Valley in Virginia, to enforce the provisions of cedar eradication laws. Nine cases have been brought on appeal before higher courts, and the constitutionality of the laws has been particularly challenged. In no instance, however, has the charge of unconstitutionality been sustained. The enforcing agencies have in general been upheld in the discharge of their duties, and considerable judicial recognition has been accorded to the revelations of botanical investigation in connection with the disease.

It is because of this judicial recognition that close study of these cases is pertinent to the general theme of this paper. A word of explanation is fitting, however, before considering them, lest the necessary viewpoint on the part of the reader be lacking and the significance of some statements thereby unappreciated. The facts and circumstances of each of the following cases are stated in the author's own words, but the final opinions of the judges to whom appeals were made are stated, for the most part, in the words of the justices themselves. This is done, rather than condense their opinions into a style more in harmony with that of the paper as a whole, because it is these opinions in their original wording which

become the law of the land, until reversed, and upon which future decisions are founded. The botanical statements in these opinions may at times appear elementary and unnecessary, if not somewhat inaccurate, but it must be borne in mind that they are presented here not because of their biological wisdom but because they are the pronouncements upon which a plaintiff either lost or won his suit. And as such they are important because they contribute to the general body of jurisprudence regarding our relations with plants.

CASE NO. 1 (46).—The first case which came into higher courts was settled in Virginia, in 1920, where the State law had been in effect since 1914 and since which year the statute had undoubtedly met other opposition but had not yet been tested in a higher tribunal. On this occasion the State Entomologist, authorized by the law to be the enforcing agent, had attempted to put it into effect by destroying the cedar trees on two parcels of land belonging to two different owners. He had notified them, presumably, that they destroy their trees, and when they refused to comply, he proceeded to remove the trees himself. The owners objected and protested before the Circuit Court of Shenandoah County, but their plea was turned down and an order issued that the trees be destroyed.

This judgment of the court did not wholly disregard the interests of the owners, however, for it stipulated that the sum of \$200 be allowed the owners as damages for injury to their land, to be paid them before the work of cutting the trees should begin. The court order specified, furthermore, that removal of the trees be done in a careful manner under the direction of the State Entomologist and at the expense of the county; that stumps not over four inches tall be left, and "those large enough therefor to be cut into fence posts seven and one-half or nine feet in length as the owners may direct, the posts to be closely trimmed; the laps or tops from said posts to be trimmed up, and so much thereof as is over two inches in diameter to be cut into cord wood lengths; the brush to be hauled to some nearby point indicated by said owners and burned at such place or places; the posts and cord wood to be piled or ranked at convenient places nearby, as the property of said owners".

Despite these reasonable conditions the owners of the trees elected to appeal the decision of the Circuit Court to the Supreme Court of Appeals in Virginia. They raised no question respecting the damages awarded by the lower court but assailed the validity of the law

under which the Entomologist wanted to destroy their trees. In the opinion of the higher court there is a lengthy discussion of purely legal technicalities respecting constitutionality which is beyond our interest. But the observations regarding the botanical aspects of the case are instructive in revealing not only the course of reasoning employed in arriving at a decision but also the kind of evidence presented at the original trial. With respect to this evidence and the facts established by it, the learned justice who wrote the opinion of the court said:

In the case before us the circumstances shown in evidence are: That red cedar trees are numerous in the vicinity of those involved in the instant cases and throughout Piedmont and the Valley of Virginia; that such cedar trees are generally infected with the disease of cedar rust throughout those sections of the State; that in such sections the growing of apples, of certain varieties which are especially susceptible to said disease and for which there is a large public demand, both in those sections and elsewhere, is a large and important industry; that, regardless of the scientific opinion of the origin of the said disease in the past, at the time the statute aforesaid was enacted and when the cases before us arose, it was prevalent in said sections; that the disease moves "from the cedar tree to the apple tree in the spring, and from the apple tree to the cedar tree in the summer and fall", certainly for a distance of one mile, and perhaps more dependent upon the direction and velocity of the winds, by which the "spores" are borne and are sown broadcast, resulting in the perpetuation and the spread of the disease. That these two kinds of trees being alternating hosts, the spores can infect either kind on which they light, and this being true, an infected orchard may in turn infect cedar trees other than those which caused the original infection, and those newly infected cedars may in turn infect still other orchards, and that this condition can go on throughout the whole district or county if the orchards and cedar trees were located with respect to each other within the radius of infection. That to a large extent at least, the orchards and cedar trees, where the latter have not been destroyed, are so located with respect to each other in the magisterial district and county in which the cedar trees in question in these cases are located, and that the same is true generally speaking throughout the Piedmont and Valley sections of the State. That the disease will die out and be eradicated in said sections of the State if either all the apple trees or all the red cedar trees are destroyed which are located within the radius of infection of each other aforesaid. That the continuance of the disease is dependent upon both of these kinds of trees as its hosts. That the destruction of the red cedar trees in said sections which thus constitute a menace to the apple orchards is absolutely necessary to prevent the extinction therein of the apple industry aforesaid. That the growing of cedar trees in said sections is not an industry. That they are not planted or cultivated, but are indigenous to the soil, springing up where the soil is not cultivated and growing wild. That they are valuable only where they have attained a sufficient size to make fence posts or fuel. That the wood of red cedar in such sections cannot be used in the manufacture of lead pencils or for any other purpose than for fuel or fence posts. Under the statute in question, all of the parts of the trees available for fuel or fence posts are left undestroyed and remain the property of the owner. That the cedar balls which form or grow on such trees of all sizes, and the foliage are the parts which become infected with said disease and are the source from which apple trees are in turn infected therewith. That such are the only parts which are destroyed under the statute, and they have no commercial value and probably

little or no value for any purpose. Certainly, as compared with the value of the apple trees, to which their existence is a serious menace, their value is *de minimis*.

The cedar trees in question are shown by the evidence to be all within one mile of some apple orchard containing some of the varieties of apple trees aforesaid, and the presence of other red cedar trees and other such apple orchards within other radii of one mile of each other in other directions are shown by the evidence to exist in such a way that it is practically certain that the continued existence of the cedar trees in question constitutes at least a material link in the chain of real menace which exists not only to the orchards aforesaid within one mile of them, but to all orchards of the character aforesaid within the district and county and sections of the State aforesaid, where the red cedar trees have not been destroyed.

On the basis of this evidence the justice then observed that:

These being the circumstances in which, and such being the menace against which, the statute is by its terms made applicable, and the remedy of destruction aforesaid being absolutely necessary to accomplish the object of the statute, namely, the control and eradication of said disease, we are of opinion that the character of the regulations provided for in the statute is not arbitrary or unreasonable, that the statute is really designed to accomplish a legitimate public purpose, that the means employed have a real, substantial relation to the public object in view, and that they do not impose an unusual or unnecessary restriction upon the lawful use of private property.

Other aspects of the case, non-botanical in nature, did not lend any more support to the charge of invalidity than did the testimony and logic of the court respecting the purely botanical aspects, and for that reason the judgment of the Circuit Court was sustained and the trees presumably removed.

* * *

CASE No. 2 (47).—In Arkansas it was Rule No. 51 of the State Plant Board that brought cedar eradication into a higher court of that State. That rule, as we have already noted, stipulates that cedar trees infected with the rust may not be maintained within one and a half miles of apple orchards in certain stipulated sections of the State. The chief inspector of the Board on one occasion found an infected tree standing in violation of this rule, and when he ordered the owner to remove the tree, his admonition was disregarded. The order was further pressed, but to no avail, and the owner eventually was summoned into court. There he was indicted, tried and convicted of violating the rule, and was fined one dollar.

Despite the triviality of the penalty the owner felt his rights sufficiently imposed upon that he appealed to a higher court. His appeal very obviously was founded upon legal technicalities, in the hope of evading the law, rather than upon any really significant exceptions. In brief, they were as follows:

a) The indictment did not charge him with a public offense but only with a violation of a rule by the State Plant Board.

b) The record did not show the existence of the State Plant Board or its personnel.

c) The official capacity of the chief inspector was not established.

d) The record failed to show that Rule No. 51 was adopted or promulgated.

e) The Rule was a law and the State Legislature had no authority to delegate its law-making power to the Plant Board.

f) Rule 51 was of no effect because the Board had not fixed any penalty for violation of it.

g) The Rule was void as being unreasonable for two reasons:

First: There was no question of health, morals or municipal government, and for that reason the subject matter was not within the police power of the State.

Second: Other methods than cutting trees were in use for preventing or eradicating cedar rust.

It suffices for our purpose to note that each of these points except the last was overruled by the court on purely legal grounds beyond our interest. With respect to the last point the court said that selection of remedies was up to the Board, not a matter for the court to decide, and in this final bit of opinion the court followed its own previous and similar decision in interpretation of cattle tick eradication statutes.

Since all the objections of the defendant were thus overruled he was compelled to pay the original fine of one dollar. One wonders, indeed, why all the fuss?, with such ineffective objections, no challenge of constitutionality or other vital principle, and only a moderate penalty to be paid.

* * *

CASE NO. 3 (48).—It will be recalled that the original Virginia law contained an inconsistency as between one and two miles, but that this was corrected in 1920 by clearly applying the law to cedars within two miles of apple orchards. It was also noted that the original law was not to be in force in any magisterial district unless adopted by that district. What would be the legal situation, one might imagine, should the original law have been adopted in some district but not the amendment, and the Entomologist have at-

tempted to remove trees outside the one-mile limit when that amendment had not been adopted in the district. This is exactly the situation which arose in Ashby district in connection with a 2,200 acre estate on which there were hundreds of cedars which served as shelter for large herds of thoroughbred cattle.

The State Entomologist had several times attempted to enforce the amended law against this property and finally sent an order that the owner destroy all cedars on two large parcels of it and that every spring he remove the fruiting bodies of the fungus from those trees which stood on about 20 acres of the land surrounding the main dwelling of the property. These trees were more than one mile from the nearest apple orchard. The owner contended, therefore, that they obviously were not affected by the one-mile statute and could not be removed under the two-mile amendment, since it had not been adopted in his district. To this and other arguments raised in his attempt to secure an injunction against the Entomologist, the final court, to which he made appeal, had the following to say:

The statute authorized counties and magisterial districts of counties to adopt or reject the Cedar Rust Law. In 1916 the original statute was duly adopted in Ashby district. In 1920 the first section of the original act was so amended as to change the distance from one to two miles. There has been no subsequent adoption of the statute in Ashby district.

The cedar trees included in the last notice given by the entomologist lie within two miles of some orchard, but not within one mile of any orchard. The plaintiff contends that the original statute did not authorize the destruction or the compulsory treatment of cedar trees standing more than one mile from any orchard. For the sake of complete argument, we shall for the time being assume that such is the proper construction of the original statute.

The optionary power given the counties and districts to adopt or reject the law relates in express terms only to the original statute. Nowhere is there the slightest suggestion that the Legislature intended to abdicate its power of amendment, or of an intent to give the county authorities a right to adopt or reject future possible amendments of the law. In the act of 1920 also there is complete absence of indication of an intent that the counties and districts which had adopted the original act were given the power to adopt or reject the law as amended. And the silence of the amending act is itself strong evidence that no such power was intended to be given.

If a statute requiring the destruction or treatment of cedar trees within two miles of an orchard is a reasonable exercise of the police power, the question here is, we think, one solely of the legislative intent. If the original statute had in both the first and second sections mentioned only a radius of one mile, and had otherwise been expressed as it was expressed, we can think of no constitutional provision which would make invalid an amendment making the radius two miles and expressly providing that the amendment should apply in districts which had previously adopted the original statute, without further action by the county authorities. The legislative act of grace, in making the application of the original act optional, could by no possibility, in and of itself, destroy the legislative power to thereafter make

laws without regard to the wishes of county authorities. And this power necessarily includes the power to amend existing laws, also without regard to the wishes of county authorities.

Thus the court disposed of the defense founded on non-adoption of the amendment. With respect to the original discrepancy in the statute, it had the following to say:

A reading of the first two sections of the statute, reveals a discrepancy which is explicable only as a slip of the pen. The danger zone is (once) stated as one mile in the first section, and it is (twice) stated as two miles in the second section. This fact alone makes the probabilities that the error was in the first section twice as great as that it was in the second section. Moreover, the fact that in 1920 the Legislature so amended the first section as to change the words "one mile" to "two miles", and left the second section unchanged, makes it a practical certainty that the error was in the first section.

The first section of the statute is unimportant. If the Legislature had the power to order the destruction of any cedar trees, a declaration by the Legislature that such trees constitute a nuisance could add nothing to its power and could not otherwise be of importance. On the other hand, the second section is of the utmost importance. In it the limits of the entomologist's duty and the limits of his power are stated. The reasonable probabilities are that, in case of a discrepancy between a very important section and a very unimportant section of a statute, the error has occurred in the latter.

Another strong ground for reading the original statute as applying to cedar trees within two miles is found in the unanimous testimony of the scientists who have testified in this case to the effect that the danger zone is two miles and not one mile. It may be added that a much more recent West Virginia Cedar Rust Law fixes the limit of three miles.

Concerning other arguments of the appellants:

It is contended that the statute is void because of the provision in respect to the written request of ten freeholders to the entomologist. Without so deciding it may be assumed that counsel for plaintiff are right in saying that such request is an absolute prerequisite to a notice from the entomologist to the landowner to destroy any cedar trees. However, it does not seem to us to follow that the statute either denies due process of law or the equal protection of the laws. The freeholders are not given any power themselves to order the destruction of cedar trees, nor can they control the entomologist in the performance of his duties, or the circuit court of the county in the exercise of its functions.

The power given is only that of putting the entomologist under the duty of making or having made an examination. The difference between this power, and a power to condemn or power to require the entomologist to condemn, is most obvious. Hence we cannot concur in the conclusion of counsel for the plaintiff that the plaintiff's rights are determined by irresponsible individuals. So long as a request is not signed by ten freeholders, the owner of cedar trees remains undisturbed. And the signing of a request does not determine anything except that at least ten freeholders desire that an official search for infected cedar trees be made in some designated territory. The provision in question tends to protect the owners of cedar trees from possible official overzealousness, as well as the orchardists from the ultimate payment of damages and expenses, incurred by the possibly unnecessary destruction of cedar trees. While the provision seems to us wise and beneficent, it is at least harmless in respect to the owners of cedar trees. If it had been omitted, the remainder

of the statute being as it is, infected cedar trees, within two miles of an orchard, in a district which had duly adopted the law, would be quite as liable to destruction as they are now. And, if the statute without the provision as to the written request would be constitutional, we are entirely unable to see why the provision in question makes the statute unconstitutional.

Botanical and economic aspects were also recognized:

It appears from the evidence that cedar rust is a fungus disease of apple trees, which cannot propagate unless there are trees of the juniper family of conifers in the vicinity of fruit trees of the pome family. Red cedar trees and apple trees of the best commercial varieties are particularly well adapted to the propagation of this disease. The balls which grow on the infected red cedar tree produce in the spring millions of spores, which, when carried by the wind to any one of many most valuable varieties of apple trees, cause the cedar rust on the fruit and especially on the leaves of the apple tree. This rust produces another spore while on the apple tree. The latter spore, if carried by the wind to any uninfected red cedar tree, infects it, and causes a production on the cedar tree of the cedar balls, which make the first-mentioned spores. The weight of the evidence clearly is that infected cedar trees within two miles of an apple orchard are from the first injurious, and in a few years are fatal, to the orchard. It also appears that, unless the cedar balls be removed early in the spring of each year from the infected cedar trees, there is no remedy for the cedar rust disease except the destruction of the infected cedar trees. Moreover, an infected cedar tree is not merely dangerous to apple trees within two miles of such cedar trees. If the infected cedar tree infects an orchard, this orchard will infect previously uninfected cedar trees, and thus this dangerous disease is widely disseminated.

Some of the conflict in the affidavits is explicable by the fact, observed by the scientists and perhaps not observed by some of the lay witnesses, that there is a very much greater infection of the apple trees in wet seasons than in dry seasons.

In the affidavit of Prof. Schneiderhan, it is said that Virginia ranks third in the production of commercial apples and first in losses from cedar rust. In the affidavit of W. P. Massey, Secretary of the Virginia Horticultural Society, it is said that over \$20,000,000 are invested in apple orchards in this state. In numerous affidavits it is shown that the apple growing industry in this state is of great economic importance.

It seems that the red cedar tree is not itself injured by becoming the host plant of cedar rust. It becomes infected, but not diseased. In addition, such trees are, at least by some people, regarded as ornamental. They have some (if rather slight) commercial value; and they are certainly useful to the landowner for making posts and poles and as furnishing protection to cattle from the sun and the flies in summer and from storms in winter. It follows that the statute here in question is not exactly analogous to those statutes which require the destruction of noxious weeds and of infected and valueless fruit trees and animals. However, the clear preponderance of the evidence is that infected red cedar trees, if not treated, which are within two miles of unobstructed space of an apple orchard will not only injure, but will destroy, the orchard. It clearly appears that in the apple growing sections of this state the value of infected cedar trees to their owners and to the public is very much less than the value of the threatened orchards to their owners and to the public. In fact, we concur in the belief that the public interest in infected red cedar trees is rather insignificant in comparison with the public interest in the endangered apple orchards. Directly and indirectly commercial apple production furnishes profitable employment to great numbers of people. While the owners of apple orchards in magisterial districts which have adopted or may adopt the statute are directly benefited by the destruction or treatment of

infected cedar trees, it is certain that many other people are also thereby indirectly benefited. Presumably the public welfare was the object the law-makers had in view, and the evidence before us does not support a belief that such was not the object.

The fact that only one class, the owners of infected red cedar trees, are injured by the statute does not deny the equal protection of the laws, since all such owners are equally subject to the law. Again, the fact that only one class, the owners of apple orchards, are the direct beneficiaries of the law, does not prevent it from being indirectly of wide public benefit. In the situation caused by the cedar rust disease, the public could be benefited only by benefiting the apple orchardists. It may be added that almost every statute which for the public good requires the destruction of diseased vegetation or of diseased animals is of more immediate and more direct benefit to some class than it is to the community generally.

It is argued that the statute is unreasonable, in that it authorizes the destruction of cedar trees, which may be of much value, without regard to the value of the orchard or orchards within the two-mile limit. This argument ignores the fact that a valueless orchard may, if infected cedar trees infect it, become a new focus of infection and thus aid in spreading the disease into theretofore uninfected localities.

And in concluding:

Because of the nature of cedar rust, commercial apple orchards cannot exist in close proximity to infected red cedar trees. This fact, at least in some sections, made an election between the destruction (or treatment) of infected cedar trees and the ruin of the apple orchards an unavoidable necessity. We are impressed by the belief that the Legislature has made this election justly and in the interest of the public welfare. In the statute we find nothing that seems to us to be arbitrary or unreasonable. It should be said in conclusion that the courts have no power to declare a statute unconstitutional unless it is clearly so. And we are entirely unable to say that the statute here in question is clearly unconstitutional.

On the basis of this opinion the plaintiff's petition for an injunction restraining the State Entomologist from enforcing the law was denied and the Entomologist thereby sustained in his eradication work. This was not the final judgment on the case, however; later, after a new State Entomologist had come into office and after another cedar case had been adjudicated, this one was reconsidered by the court. We shall therefore refer to it again after considering the next which in its final disposal contributed to the precedent on which this one could be settled.

* * *

CASE No. 4 (49).—In this case the cedars sought to be destroyed by the authorities grew wild, mostly on grazing land, and were not propagated for commercial purposes. They varied in height from mere sprouts to shrubs or trees six or eight feet tall, and some were even taller. The smaller ones were used to some extent for "Christmas trees", and the chief use of those of sufficient size was

for fence posts. The utility or commercial value of the trees as a whole was comparatively small, but ornamentally they contributed to the value of the land on which they stood. It was because of the last feature, in particular, that the owners objected to their being removed, for, they claimed, the market value of their property would be decreased from \$5,000 to \$7,000. They brought suit, therefore, against the State Entomologist to prevent his destroying them when he found that they stood within a mile of valuable apple orchards. The Circuit Court of Shenandoah County again sustained the Entomologist, and the owners of the trees appealed to the Supreme Court of Appeals.

In commenting upon the value of the trees under consideration this court again recognized their dangerous nature by observing that:

They are, however, the deadly enemy of certain very valuable commercial apples; so deadly that one or the other must go, as no practical method has been discovered whereby the cedar may be treated so as to render it innocuous. Many millions of dollars have been invested in commercial apple orchards in the state, and the industry has been developed to such an extent that the state stands third or fourth in the United States in the production of commercial apples. This development has been especially marked in the Valley and Piedmont sections, and it is said that the Valley alone had a normal annual production of about a million and a quarter barrels. These orchards, while especially valuable to the owners, furnish employment to a large number of laborers and others.

The opinion of the court then considers each of the points on which the tree owners made their appeal. First, there was the matter of constitutionality, and on this score the same objections were raised as had been brought forth in the same court by the parties of what we have described as Case No. 1. The court carefully reviewed its decision in that case and could find no reason for changing its conclusion with respect to the validity of the statute again under discussion. In addition, its constitutionality had since then been upheld by a United States District Court in what we have already considered as Case No. 3. All objections, therefore, which were raised in the present case on the grounds of alleged invalidity were overruled and that aspect of the matter thus settled.

Secondly, the amendment from one to two miles was again brought into play by the appellants. They argued that the amendment operated as a repeal of the original act and that since the amendment had not been adopted in their magisterial district as allegedly required by law for it to become effective there, there just

was no Cedar Rust Act in force in that district. On this point the court had the following to say:

Why one mile should have been inserted in the first section of the act and two miles in the second section is a mere matter of conjecture, with which, in our view of the case, it is unnecessary for us to deal. It may be observed, however, in passing, that the first section appears to be a mere declaration of public policy, declaring the infected cedar trees within one mile to be per se a public nuisance, and might have been omitted, without impairing the completeness and efficiency of the residue of the act.

In the instant case . . . the only change made was the substitution of the word "two" for the word "one". . . . The remaining sections on the subject were left unchanged. This did not in any way affect or change what had already been done under the original act, but simply extended the area within which thereafter infected cedars should be deemed per se a public nuisance. There is no intimation of any other intention.

When the counsel for the appellants still tried to prove their point by citing two Texas cases to support their contention, the court observed that:

The facts of the instant case are so entirely different that they render the cases cited inapplicable. As there are several orchards within a mile of the infected cedars, there is no occasion to resort to the amendment extending the limit to two miles. We do not mean to intimate, however, that we would not enforce the amendment if the orchards were beyond the one mile, but within the two mile, limit. It is simply not necessary to decide that question.

The necessity of deciding this question did arise, we have already noted, in Case No. 3, and more will be said concerning it when that case is again considered after completing the present one.

As a third objection the appellants claimed that the trial court had erred:

In holding that, even if such statute is in force in said county and district, all of the red cedar trees on petitioners' land are subject to destruction, whereas, in any event, no red cedar trees other than such as are or may be sources, harbor, or host plants of cedar rust are included in the denunciation of the statute.

To this the court replied:

The testimony shows that all red cedar trees in proximity to apple trees *may be* the source, harbor, or host plants of cedar rust. It is not necessary to wait for absolute infection before the cedars may be destroyed. Such a construction would nullify the words "may be" contained in the statute.

Finally, the appellants objected to the trial court's having rejected their evidence tending to prove that they would sustain damages to their property ranging from \$5,000 to \$7,000 should their trees be removed. The trial court also held that the statute did not require that compensation be paid to them for any diminution in the market value of their land, and to this they also protested. These holdings

of the lower court were also sustained, for, in the opinion of the higher court, while the law provided compensation in cases of material damage to property, they could "find no indication in the statute of an intent to pay for scenic value".

All the objections of the cedar owners were thus overruled and once again eradication of cedar trees in close proximity to valuable apple orchards was legally enforced.

* * *

CASE NO. 3 (*Cont.*) (51).—Final hearing of Case No. 3 took place after the foregoing case was settled and thus contributed to the precedent upon which Case No. 3 could be adjudicated. Since the facts have already been stated we need consider only the further comments of the court which began as follows:

We need not repeat nor elaborate what was said in our former opinion as to the constitutionality of the statute. On the final hearing much evidence was introduced as to the nature of the cedar rust disease and its destructive effect upon the apple-growing industry. In the light of that evidence we have no doubt that the enactment of the statute was a valid exercise of the police power of the state. Properly considered, it does not authorize the taking of one man's property for another man's benefit, but is a reasonable regulation of the use of property in furtherance of the public welfare. It authorizes the destruction of trees, which are shown to be of but comparatively little value, only where they constitute a menace to a great industry of the state.

The state cannot, of course, take one man's property for the benefit of others; but it can say that in the enjoyment of property the owner shall not use it in such way as to endanger the rights and property of others. It is quite apparent, from the evidence in this case, that one who allows infected cedars to grow upon his land in an apple-growing community is maintaining that which is a constant menace to the business of the community. He no more has a right to use his land in growing such trees than he has to use it as a place for keeping animals afflicted with contagious diseases, or for storing dangerous explosives, or for maintaining a business which endangers the safety, morals, health, or general welfare of the community.

The appellants, in citing another case and decision in support of their contention that their property was to be destroyed on the order of ten freeholders who petitioned the Entomologist to make investigations, elicited the following reply:

It is manifest that the principle decided in that case has no application to the case at bar. The only similarity between the two cases is that in each the statute provides for action by public authorities upon request of property owners. In the Eubank case, however, the request of the property owners was mandatory, and the action by the public authorities merely carried out their will. Here the request of the freeholders merely imposes upon the state entomologist the duty of making inquiry and does not control his action. The destruction of cedar trees is authorized only upon his finding that they are the host plant of the cedar rust disease and constitute a menace to apple orchards in the locality. Upon such finding the destruction of the trees is authorized on the ground that they constitute a public menace; and the evident

purpose of the statute in requiring a request from 10 freeholders before the entomologist is required to make an investigation is to insure that a considerable portion of the public are affected by the nuisance before setting in motion the machinery for investigating and abating it as such.

No value was attached to the appellants' charge of vagueness and indefiniteness in the use of the words "orchard" and "locality" in the statute. And with respect to the contention that only those trees definitely known to be infected could legally be removed, the reply was that the highest court of the state had ruled, as we have already noted, that uninfected trees might also be destroyed if regarded as necessary.

In considering the one *vs.* two mile difficulty, the court's opinion says:

The contention of complainant is that the statute as originally enacted must be construed as authorizing destruction of cedars only within the one-mile radius, and that the amendment of 1920 did not change the act so far as it affected the Ashby district, for which it had been adopted under the local option provision prior to the amendment. We have given careful consideration to this contention, but we do not think that either of the propositions upon which it rests is sound.

After elaborating upon this point the opinion terminates by observing that

The conclusion that the act as amended should be interpreted as extending the one-mile radius to two miles without further adoption by the local authorities is, as we think, not only in accord with reason but also with well settled rules of interpretation.

As said by another authority:

A statute which is amended is thereafter, and as to all acts subsequently done, to be construed as if the amendment had always been there, and the amendment itself so thoroughly becomes a part of the original statute, that it must be construed, in view of the original statute, as it stands after the amendments are introduced and the matters superseded by the amendments eliminated.

The petition against the Entomologist was thus dismissed and the principle of eradicating less valuable plants for the protection of more valuable ones jeopardized by the proximity of the former, once more sustained.

* * *

CASE NO. 5 (50).—In 1928 the United States Supreme Court was called upon to render judgment upon the cedar eradication law of Virginia and thereby establish the validity of the statute in the highest tribunal of the land. As in all the other cases, the trouble began when the State Entomologist ordered someone to cut down

the cedar trees on his land because they were a menace to apple orchards in the vicinity. The owner appealed to the Circuit Court of Shenandoah County, where cedar rust disputes must have become a matter of routine, but secured no relief, except to be awarded \$100 to cover the expenses of removing his trees; he then appeared before the Supreme Court of Appeals of Virginia, but there the judgment of the Circuit Court was affirmed; and finally he appealed to the United States Supreme Court.

Because of the significance of this appeal and its final adjudication, it is worthwhile to consider the brief presented to the court as well as the full opinion of Justice Stone in settling the matter. The appellant's attorneys argued thus:

The statute is invalid in that it provides for the taking of private property, not for public use, but for the benefit of other private persons.

The enforcement of this law against plaintiffs . . . , involving the destruction of all red cedar trees on their land, would result in the taking of property values of considerable magnitude—not less than five to seven thousand dollars as they offered to prove.

We submit that the case is in no wise controlled by the decisions cited in *Bowman v. Entomologist* [Case No. 1], in which statutes have been held valid which provided for the destruction, as nuisances, of noxious weeds (never of any value for any purpose); or of fruit trees infected with San José scale; or of peach trees affected by the "yellows"; or of apple trees infected with fruit scab, or of oranges affected by "citrus canker"—in all of which instances the disease was one so affecting the trees to be destroyed that their value as property was utterly annihilated, and whose destruction, therefore, in order to preserve healthy trees, could in no proper sense be regarded as a taking of property. Such trees, so diseased, become of course, from the standpoint of value, of the same class as noxious weeds, and within the *de minimis* doctrine.

But in the case at bar, the cedar trees are not themselves injured in the slightest degree as a result of their becoming hosts of the cedar rust. Nor is their contribution to the market value of the land on which they grow at all diminished thereby.

It seems a wholly untenable view that of two species of valuable property, one may be selected for destruction for the protection of the other from the effects of a disease for whose existence and continuance they are interchangeably responsible.

In no case can property be taken for private use, and the taking of property for public use without due process of law and proper compensation cannot be justified under the guise of the exercise of the police power.

Neither the public health, the public safety, nor the public morals or general welfare will be benefited or promoted in any degree by the statute in question. The alleged injury to the apple orchardist will not justify his shifting the damage to his neighbor's shoulders.

We submit that there is not, in the American theory of government, any room for the view that one man's property may be taken or destroyed, either directly by eminent domain or indirectly, under the guise of taxation, or of the police power, in order to enhance the property values or the financial prosperity of another. The statute prescribes no means whereby the relative proportions or values of the growths of cedar trees to be destroyed in a particular case, and of the growths of the apple trees sought to be protected thereby, shall be measured. It is not even required that the entomologist or

the court shall be of the opinion that the orchards for whose benefit the destruction of the cedar owner's property is required, as compared with the cedars, are of any considerable value; that they shall be sufficient in extent or value to be deemed commercially important; or that, in any way, they shall be shown capable of any material contribution to the general prosperity of the State or of the community in which they exist—even indirectly by adding to the values of its industries or contributing to its aggregate wealth.

If it be assumed that the orchard industry of the section at large from which the case comes is one of considerable profit, that profit redounds to the benefit, not of the State or any of its political subdivisions nor of any public activity, but of the private owners of the orchards. If it can be said that their prosperity is a part of the general prosperity, the same is true of every profit gaining enterprise in which citizens engage, and if the police power extends to the promotion of the welfare of orchard owners, by means of the taking or destruction of valuable private property, it would seem clear that any of the other industrial or profit-making enterprises of a portion of the people may be likewise so promoted. Upon such a view the property destroying capacity of the "police power" would be absolutely limitless, and the constitutional protection of property rights but hollow mockery.

Control of property of plaintiffs . . . is exercised under the statute by other owners of property.

The Virginia Court has itself declared [Case No. 1] that the red cedar trees denounced by the Cedar Rust statute are not nuisances at common law.

The statute is void for vagueness and uncertainty. It contains no criterion whatever by which to determine who are the freeholders of the locality to whom is confided the power of invoking the axe of the Entomologist. Again, what is the "locality" intended by the statute? No technical meaning attaches to the term.

The Virginia Court, in its opinion, has placed two interpretations on the term "locality" so opposed to each other, that it would seem that the matter is still open for determination by this Court. But if it be held that the term "locality" is sufficiently definite, what is to be said of the term "orchard" or "orchards". How many apple trees must be grouped together to constitute an "orchard"?

The statute, as construed, is plainly contrary to the first clause of the Fourteenth Amendment Federal Constitution.

Here, then, was the basis upon which the tree owners made their final attempt to prevent the State Entomologist from enforcing the law. Justice Stone, in formulating the concluding opinion in this decisive case, first briefly reviewed the history of the case and the provisions of the Virginia Cedar Law, and then proceeded:

As shown by the evidence and as recognized in other cases involving the validity of this statute . . . cedar rust is an infectious plant disease in the form of a fungoid organism which is destructive of the fruit and foliage of the apple, but without effect on the value of the cedar. Its life cycle has two phases which are passed alternately as a growth on red cedar and on apple trees. It is communicated by spores from one to the other over a radius of at least two miles. It appears not to be communicable between trees of the same species but only from one species to the other, and other plants seem not to be appreciably affected by it. The only practicable method of controlling the disease and protecting apple trees from its ravages is the destruction of all red cedar trees, subject to the infection, located within two miles of apple orchards.

The red cedar, aside from its ornamental use, has occasional use and value as lumber. It is indigenous to Virginia, is not cultivated or dealt in com-

mercially on any substantial scale, and its value throughout the state is shown to be small as compared with that of the apple orchards of the state. Apple growing is one of the principal agricultural pursuits in Virginia. The apple is used there and exported in large quantities. Many millions of dollars are invested in the orchards, which furnish employment for a large portion of the population, and have induced the development of attendant railroad and cold storage facilities.

Thus did Justice Stone give judicial recognition to the agricultural and purely botanical aspects of apple rust and remove those teachings from refutation in lower courts of law. With respect to application of the Virginia law, he then wrote:

On the evidence we may accept the conclusion of the Supreme Court of Appeals that the state was under the necessity of making a choice between the preservation of one class of property and that of the other wherever both existed in dangerous proximity. It would have been none the less a choice if, instead of enacting the present statute, the state, by doing nothing, had permitted serious injury to the apple orchards within its borders to go on unchecked. When forced to such a choice the state does not exceed its constitutional powers by deciding upon the destruction of one class of property in order to save another which, in the judgment of the legislature, is of greater value to the public. It will not do to say that the case is merely one of a conflict of two private interests and that the misfortune of apple growers may not be shifted to cedar owners by ordering the destruction of their property; for it is obvious that there may be, and that here there is, a preponderant public concern in the preservation of the one interest over the other. And where the public interest is involved preferment of that interest over the property interest of the individual, to the extent even of its destruction, is one of the distinguishing characteristics of every exercise of the police power which affects property.

In a manner outside our interest, Justice Stone briefly commented upon the question as to whether the infected cedars constituted a nuisance according to common law. He then gave heed to the claim, put forth also on previous occasions, as we have already noted, that the ten freeholders who called upon the Entomologist were illegally imbued with power to cause destruction of their trees. In a previous case this court had ruled against the power given certain property owners to compel a certain committee to enforce rulings against other property owners. The present appellants argued that the ten freeholders had no more legal right to demand destruction of their trees than did those property owners to compel a committee to inflict their desires on other owners. This was refuted thus:

The function of the property owners there is in no way comparable to that of the "ten or more reputable freeholders" in the Cedar Rust Act. They do not determine the action of the state entomologist. They merely request him to conduct an investigation. In him is invested the discretion to decide, after investigation, whether or not conditions are such that the other provisions of the statute shall be brought into action; and his determination is

subject to judicial review. The property of plaintiff in error is not subjected to the possibly arbitrary and irresponsible action of a group of private citizens.

The decisions of the lower courts were thus affirmed in the highest tribunal of the country, but the judgment, while it supported in general the policy of compelling eradication of cedar trees for the benefit of apple orchards, applied only to the Cedar Rust Law of Virginia. Similar laws in other States might still be questioned and subjected to judicial examination in those States, and we shall now see that this has been the course of events.

* * *

CASES NOS. 6 & 7 (52, 54).—For the sake of completeness in this account we must at least briefly mention two other cases which came up on appeal, though the points of contention and the opinions are not so directly related to the plants involved as are those of the foregoing cases. One of them, settled in 1927 in West Virginia, came into the Supreme Court of Appeals of that State on a question of ascertaining the amount of damages to be awarded the owner of 1200 trees destroyed by the State Entomologist. The other, in New York, 1929, also involved damages to be collected by the cedar tree owner, but the quantities were much greater. More than 10,000 trees, most of them probably spontaneously arisen seedlings, had been destroyed by the authorities on a 116 acre estate extending half a mile along the Hudson River between Kingston and Newburgh. The Commissioner of Agriculture and Markets had awarded the owner \$2,500 for the trees, but his claims for much greater compensation were well founded, for the Supreme Court of the State increased the compensation to \$7,000.

* * *

CASE No. 8 (53).—The most dramatic situation in connection with any eradication legislation, so far as the author has been able to learn, developed in West Virginia as a result of that State's law against red cedars. The plaintiff and principal character was an elderly lady, Miss Susan M. Lemon, who owned about ten acres of land with some 500 cedar trees growing on it within three miles of certain apple orchards. In 1925 and again in 1927 apple orchardists of the vicinity had filed petitions with the State Entomologist that he investigate the neighborhood of their property for infected cedars. In January of 1929 he found such trees on Miss Lemon's

land and gave her written notice that the trees must be cut down and destroyed within five days. When his order was not heeded, he and his assistants entered upon her land and proceeded to remove the trees themselves. Miss Lemon succeeded in procuring a temporary injunction against them, but not until they had already cut 164 trees. They desisted from further action until a hearing in the Circuit Court, and when that came about the injunction was dissolved. Miss Lemon then brought the matter before the West Virginia Supreme Court of Appeals. The appeal questioned the constitutionality of the statute, the sufficiency of the petitions and the propriety of the procedure.

On the first point the opinion of the court noted that the act under which the Entomologist was operating "is modeled closely after a similar act in Virginia, which has been held constitutional, not only by the Virginia court, but by the federal courts". This was obviously in allusion to the foregoing cases which we have already discussed. The opinion then quotes one authority to the effect that "the authorities leave no room for doubt that pests of various sorts may constitute nuisances, and that the Legislature as a consequence has power to provide for their abatement", and then comments upon this by saying: "So well established is this legislative right that we see no useful purpose in elaborating here the principles supporting it". Thus, and with a few other legal considerations, the charge of unconstitutionality was dismissed. The Entomologist's notice, the court found, substantially complied with the statute, and the contention that the period of five days allowed by the notice for her to cut the trees was insufficient, was also without merit because, though she could not have been expected to cut 500 trees in five days, she had not made any attempt either to comply with the notice or to secure an extension of time.

Miss Lemon's property was on the south bank of the Potomac, only a few hundred feet from the opposite Maryland shore. In that State there was not any anti-cedar law but plenty of cedar trees, and one of the strongest points of the appellant's complaint was that cutting her trees would not prevent infestation of the surrounding apple orchards from those cedar trees just across the river. But to this argument the court replied that destruction of her trees would remove one source of infection and that it was "an accepted principle that the existence of a nuisance may not be justified by the fact that there are other similar nuisances in the vicinity".

The decree of the Circuit Court in dissolving the injunction was thus sustained and the Entomologist encouraged to proceed with his eradication work.

The furor created in the vicinity of Shepherdstown where this conflict developed was considerable, and it is fitting that we give some consideration to the writing of one commentator who very obviously was not in sympathy with the law. Commenting upon the final judgment of the court, he wrote (5):

This decision immediately inspired the radical group of orchardists. With the cooperation of the West Virginia Horticultural Society they have instituted a movement for federal legislation, which would make it possible for small groups to order the destruction of cedar trees anywhere in the Union.

The fact that the law gives no compensation whatever to those who suffer the loss of their evergreens, has brought up the contention that the law was passed in utter disregard of the fundamental principles underlying the American system of law and jurisprudence as well as the spirit of the Federal Constitution in that:

No effort is made by the advocates of the evergreen destruction to agree beforehand with property owners upon the value of the property to be destroyed, either through court proceedings or a condemnation board; and that the destroyed evergreens are permitted to fall where they will and lie where they fall, to the damage of the land, placing upon the owners the burden of removal. Only by filing suit against the state can damages be demanded, and the law provides that the value of the trees in themselves or their value to the property in question is not to be considered.

The movement for Federal legislation, so far at least, seems not to have progressed beyond its incipient stage, and a petition circulated and signed by 1,100 residents of the neighborhood to have the law amended had no effect. Their petition, stimulated by the temporary injunction which had been secured against cutting the trees, sought to permit preservation of cedars where their value was greater than that of the orchards jeopardized by them. The crusade to save the cedars was not yet discouraged, however. In the words of our already quoted author:

The vigorous and valiant attempts of the 1,100 petitioners of Shepherdstown to save their cedars from the ax were not without many exciting and colorful episodes.

An organization known as the Farmers' Alliance was formed in an effort to save the trees. Individual citizens, clubs and societies gave their whole-hearted support to the cause, using every conceivable method and ruse to prevent or even delay the mass slaughter of the evergreens.

When cutting was begun on the Lemon property the people became frantic. All appeals to representatives of the law in Shepherdstown, Charlestown and Martinsburg had proved futile. As a last resort Miss Serena Katherine Dandridge, a prominent artist, decided to go to Charleston and secure from the supreme court an injunction against all cutting.

The story of Miss Dandridge's 400-mile ride through the mountains at night by herself in an effort to save the evergreens, will long be remembered.

She left Shepherdstown early one morning and late that afternoon had secured the injunction against cutting any cedars in her district. On her return trip to serve the injunction her car was wrecked and she was forced to walk five miles for aid, through a cold blustery rain.

While the injunction stopped all cutting for 1929, the cedar was doomed the very next year. Thus the remaining five acres of cedar on the Lemon property were to be hewn to the ground. When all other attempts to save the trees had failed, it was suggested that the sacred folds of the American flag be draped over the sturdy boughs of the larger trees. It was intended as an appeal to the spirit of the Federal Constitution as originally conceived and put into operation by the founders of the Republic.

The flag suggestion was carried out immediately, and with much enthusiasm and hope. Miss Dandridge soon had Old Glory waving proudly from the tops of the cedars on her property. The axmen started to take the flags from the trees but were informed by officers of the law that they had no right to touch the flag but could cut the trees with the flags on them.

Miss Dandridge then had the state crew of cutters working on her property arrested. After promising not to return and cut more trees, the men were set free until the case was to be tried. The cutters did not keep their word, and the next morning Miss Dandridge saw the axmen laying low the cedars.

Thus began a remarkable as well as a memorable day for the artist. Her methods were simple but effective. She went up to one tree that was being cut and placed herself between the tree and the ax. The workmen fumed and pleaded, but they could do nothing but move on to another tree.

There were fourteen men cutting, and the task of trying to keep them all from work kept Miss Dandridge quite busy. She varied her procedure by seizing tools. In the afternoon she abandoned the active work of interfering with the cutters and took up her post at the base of a magnificent cedar tree. She was determined to save at least one of the big evergreens. The patience of the cutters was becoming sorely tried. The perplexing question was when would Miss Dandridge move from her post, so that cedar, too, could be cut.

One by one through the day the cedars came thudding to earth. Many of them had flying in their upper branches the American Flag, which had failed to save them from slaughter. The nearer the cutters cleared the way in the direction of the tree which Miss Dandridge was trying to protect, the higher became the speculation of how she would be removed so that the tree could be cut. Finally in the early twilight of the winter afternoon Miss Dandridge's embrace was loosened. Her fingers were unlaced, her arms unclasped from about the tree, and she was moved to safety. Instantly the cutters fell upon the last of the lot, a splendid forty-foot specimen, with Old Glory floating bravely from its topmost branch.

Determined to have the American flag flying over her land, Miss Dandridge had a tall flag-pole erected in the center of the field. The flag was placed at half-mast, as it remains today. Beneath it on the ground are forty-eight smaller American flags representing the States of the Union.

Such lush sentimentality may be challenged in its appearance in *The Botanical Review*; but it constitutes a part of the history of man's legal relations and social problems as a result of his close association with plants, and as such it can not be wholly disregarded.

* * *

CASE No. 9 (54).—The Cedar Rust Law of Nebraska was the latest of the State ordinances to be challenged on the grounds of unconstitutionality. The occasion arose in 1932 when the State

Department of Agriculture was about to cut down 500 or more cedars growing on the lands of 17 property owners who thereupon started legal action to enjoin the Department from so doing. Considerable evidence was introduced at the hearing which we may pass by because it involved little dispute. The trees were in a valuable apple-producing region of the State, six of the neighboring counties in 1931 having produced 600,000 bushels of the fruit. The trees were of value to their owners in furnishing protection from winds and snow, and considerable sentiment was attached to the largest single holding of 350 trees, for they had been planted many years previously under the inspiration of J. Sterling Morton, a prominent, agricultural-minded benefactor and politician of the State, as well as the originator of "Arbor Day".

The constitutionality of the act was attacked on a number of points, principally that it involved taking valuable property rights without due process of law; that the taking was for the benefit of a special class, arbitrarily and unjustly set up; that it was special legislation in favor of the owners of apple orchards of 1000 or more trees; that it involved taking property rights without compensation; and provided for taxing the plaintiffs with the costs of cutting the trees and destruction of their property, contrary to the Constitution of Nebraska. In short, the statute was a violation of both the Federal and State Constitutions.

In a lengthy and legally technical opinion the court considered each of these objections but found none of them of sufficient weight to establish the land owners' charge of unconstitutionality. It suffices for our purpose to note that the law again was unequivocally upheld.

IV. "NUISANCE" *VERSUS* "EQUITY" APPROACH IN LEGISLATION

From a purely legal standpoint it has been well established by the eleven court decisions considered in this historical study that the state has a constitutional right to destroy or to demand destruction of alternate hosts of heteroecious fungi when no other satisfactory means of control is available and when by such action valuable crops are protected. In rendering these consistent decisions the courts have ruled:

1. That such eradictory measures do not involve taking property without due process of law.

2. That the state in deciding upon the destruction of one class of property in order to save another does not exceed its constitutional powers.

3. That the laws do not impose an unusual or unnecessary restriction upon the lawful use of private property.

4. That the benefits of eradication do not accrue only to the owners of the protected host plants but also to the general public.

5. That the injury to the owners of the condemned hosts, since they constitute one particular class of persons, does not deny equal protection of the laws.

6. That such laws as have been promulgated are not arbitrary or unreasonable.

7. That the laws do not authorize the taking of one man's property for the benefit of another.

These judicial dicta, it must be noted, have all been pronounced from the "nuisance" approach to eradication work. But cedar trees, *per se*, are no more a nuisance than are apple trees, and this is equally true of barberry, currants and gooseberries. They have real value in themselves and, though admittedly instrumental in the dissemination of economically important plant diseases, are certainly not to be placed in a class, let us say, with poison ivy, or with hemp which may be used as a source of the powerfully dangerous marijuana.

It has been urged, therefore, by impartial and disinterested critics, that considerations of equity as between two actual property values should enter into eradication work, and that the work be conducted not merely by penalizing the owners of condemned plants through destruction of their property, but by dealing with the situation on a more equitable basis along the lines of condemnation proceedings in realty matters. The two principal features of such a basis, in apple rust for instance, would be that the apple owners, as chief beneficiaries, bear part of the cost, and that the cedar owners be adequately compensated for property sacrificed.

Only once in all the barberry legislation that has been enacted, has this aspect been considered. That was in the Michigan law of 1919 wherein compensation is to be paid for uninfected plants which are destroyed under official orders. In Maine, Michigan, Minnesota, Pennsylvania and Rhode Island identical provisions were made with respect to currants and gooseberries. In none of these

States, however, is reimbursement given for shrubs which are destroyed because of their being infected. The owner of an elm tree, afflicted with the Dutch elm disease, undoubtedly is benefited by removal of his tree; it would probably die anyway, and an unsightly plant is eliminated. But barberry, currant and gooseberry bushes do not necessarily lose their value as a result of rust infection, any more than do lilac bushes which are perennially covered with mildew.

It would appear, therefore, that an equitable handling of the matter should include compensation to the owner for destruction of any bushes, infected as well as uninfected. Obviously, such compensation must be limited to cultivated material actually growing in a region at the time eradication legislation for that region is enacted; and care must be taken that it could not be claimed for spontaneously arising bushes or for any planted after enactment. This principle has been expressed in an opinion of the Attorney General relating to black currant plants in connection with the Conservation Law of New York (162a).

If this be true of barberries, currants and gooseberries, it is even more applicable to red cedar trees, for they usually represent greater intrinsic value, and recognition has been accorded this fact. The so-called "Pennsylvania Plant Pest Act of 1937", for instance, after giving enforcement officials the necessary authority to combat plant pests in general, specifies that with three exceptions no damages shall be awarded to owners for loss or destruction of plants, plant products or other material in enforcement of the act. The three exceptions refer to common red cedar, and cultivated currant and gooseberry bushes, but only to plants other than nursery stock. The law says that when it becomes necessary to require or cause destruction or removal of such bushes or trees from land, the owner of which is in no way responsible for their existence, compensation shall be paid upon claims properly made by the owner, but not to exceed 70% of the value of the plants as determined by the Pennsylvania Department of Agriculture. Here no distinction is made between infected and uninfected plants; all of them when destroyed merit recompense, even when their owners are not responsible for their existence. This specific provision embodies the extreme of equity in any eradication law. If the landowner is not responsible for the existence of cedar trees, he probably has no particular in-

terest in them, and one wonders how wise it is to compensate him for the thousands of such seedlings that may spring up spontaneously on his land. Perhaps a meagerness of awards takes care of the matter.

The Virginia law of 1914 gives red cedar owners the right to submit the Entomologist's orders to the county circuit court, and this court may determine the amount of damages, if any, to be paid to the tree owner out of the general county funds. Such expenses are to be reimbursed by a special levy of not more than one dollar per acre on all apple orchards planted ten years or more, and not more than fifty cents per acre on all orchards planted more than two but less than ten years in each magisterial district in which the law might become operative.

In the so-called "Crop Pest Act" of West Virginia provision is made for submission of damage claims to a board of three arbitrators if the owner and commissioner enforcing the law cannot agree.

It must be recognized, however, that the principle of compensation, unless guarded against abuse, as already suggested, may entail difficulties and be impractical. In two States, for instance, such provisions have been rescinded. The "Cedar Rust Law" of 1929 in Nebraska gave directions not only for paying damages to owners of trees destroyed but also for reimbursing the counties for such payments by taxing the benefited orchardists up to \$1.50 per acre. By a revision two years later not only was the feature of compensation dropped but the stipulation was added that owners neglecting to destroy cedar trees after being properly notified to do so, be penalized.

The New York law of 1917 covering white-pine blister-rust illustrates the evolution leading to withdrawal of a compensation feature. The original law said "fair compensation shall be allowed for all trees or plants destroyed". In 1926 this was changed by limiting compensation to "all trees or cultivated *Ribes* or *Grossularia* destroyed". In 1929 further limitation was made by applying compensation only to "undiseased" trees or cultivated *Ribes* and *Grossularia*, except cultivated *R. nigrum*, *R. odoratum* and *R. aureum*. The law further specified that no compensation would be paid by the State for any *Ribes* or *Grossularia* destroyed in connection with establishing *Ribes*- or *Grossularia*-free zones around commercial nurseries; such compensation, it said, had to be paid by

the operators of the nurseries. By 1930 when the onus was lifted from *R. odoratum* and *R. aureum*, compensation became applicable to them, but, again, only when undiseased.

In conclusion it may be said that the equity aspects of eradication legislation have been recognized, that some legislative acts take them into consideration, that there are difficulties in putting them into practice and that any future development of jurisprudence on the subject, in order to secure public support and not inspire a sense of outrage, must proceed with an equity approach rather than merely as a crusade to abate a nuisance.

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VII. AN APPEAL

It is hoped that the contents of this article will some day reappear as part of a more comprehensive treatment of "Plant Life and the Law of Man". The author would therefore appreciate having his attention drawn to any omissions from or errors in the present treatment.

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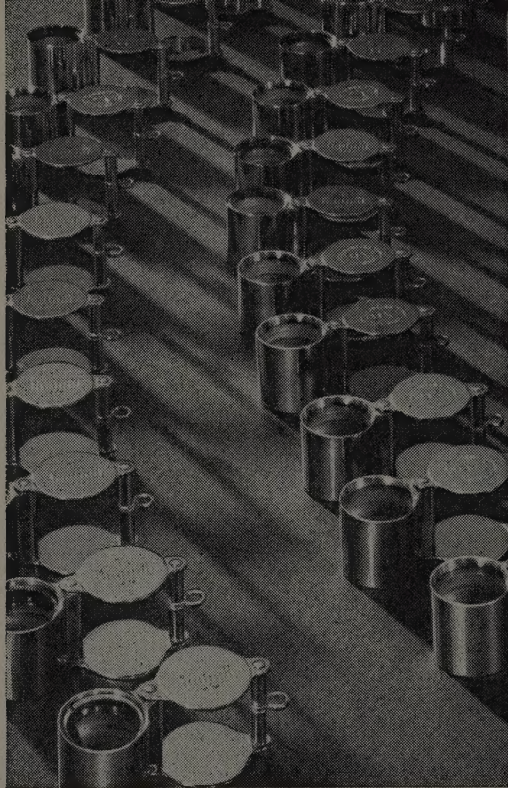
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